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ARTICLE I.

PHYSIOLOGY, PATHOLOGY AND THERAPEUTICS OF MUSCULAR EXERCISE.

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PHYSIOLOGY.

Phenomena.—When an individual exercises actively to the extent of producing perceptible effects, there are a glow of redness on the surface, an increase of temperature, perspiration and respiration. These circumstances are apparent to the observation of the most careless observer. Upon closer scrutiny into the manifestations of muscular exercise, we find the heart and arteries beating rapidly and several of the secretions increased in quantity, and their peculiar products enhanced to a considerable extent. The urinary secretion, the secretion of the liver, skin and the pulmonary excretion, are all carried on more actively than in a state of repose, while the secretion and excretion of the alimentary mucous membrane are diminished. I speak now of an amount of exercise that produces quite obvious phenomena. I am inclined to the opinion, however,

that moderate and prolonged exercise increases all the excretions beyond what they are in protracted repose. These are the more obvious phenomena of exercise. The interesting question now arises, how are they produced? What are the intimate circumstances transpiring during the exhibitions mentioned? Voluntary motion of the muscular organs is preceded by innervation, the production and transmission of the power of the will, and the contraction of the muscular fibrilla. Every functional action of whatever kind occur as the effect of cell change. This proposition is true in relation to the production of the power of volition in the brain and the contractions of the muscular fibrilla, as well as the secretory processes. Each time the nervous or mental action is effected, cells receive from the cerebral tissue and impart to it certain elaborate and effete material; the latter derived from the disintegration of the nervous or cerebral mass, and the former to be used for its repair. So also the muscular tissue at each contraction receives through the medium of cell action or change, material from the blood intended for the repair of the damage sustained during contraction, and throws into the circulating fluid through the same agency the effete substance lost in its disintegration. We may state it as a correct proposition, that one of the necessary conditions of action in an organ is organic destruction or disintegration and repair. The disintegration occurring simultaneous to and most likely being the result of action in each particular instance, and the repair a necessary prerequisite to future action, the organ in this way would constantly retain its integrity of structure, notwithstanding ever-recurring change, as the effect of action. Chemical or vital affinities, or both, between the changing tissues and the constituents of the blood, effects this interchange of substances as rapidly as the acting organs are called upon to perform their functions. This principle, it will be seen, precludes the probability of organic change being left behind as the result of action while the organ remains capable of its duties, and teaches the doctrine that so soon as the play of affinities from any cause is so weakened, or rendered impracticable from want of nervous stimulus or blood products, that

repair is not perfect, the function will be imperfectly discharged, or entirely cease. Any disease of the nervous system that disturbs its presiding capacities, as in fevers, severe shocks, pressure upon the brain, etc., thus incapacitates a certain portion or the whole of the system, owing to the extent and gravity of the nervous lesion for functional action. The reciprocal affinities in this case are lost for want of nervous agency. If the nervous system be but slightly affected, the affinities are merely more tardy; if gravely, they are entirely suspended. Thus, the blood and muscle may both possess all of their own special chemical and vital properties, and yet not be capable of acting and reacting upon each other, then the muscular contraction must cease.

You will recognize in this statement of conditions the pathology of paralysis from cerebral congestion, pressure from effusion, or pressure or inflammation on or in a large nervous trunk. Another source of functional tardiness and even suppression, is the want of the proper material to sustain the organs in a state of integrity under functional action. If the blood is prevented from elaborating the various materials which go to form nerve and muscle, from the presence of some poison as carbon, urea, bile, etc., the functions are performed imperfectly, and if carried to a great degree of contamination, the blood is entirely incapable of supporting functional action, and these all cease. If also from want of nutrition, the blood does not receive the substances from which muscle, nerve or other organic elements may be produced, these last will not be elaborated, and hence the chemical affinities resulting from their presence could not take place, the muscle cannot act with energy, if at all, the nervous functions are performed irregularly and imperfectly, the secretions are scanty and unhealthy, because the material out of which the repair after functional changes in the organ is not supplied, and all succeeding efforts become more and more imperfect until they cease entirely. This is the condition of things in anemia, and it accounts for the tardiness of the bowels, the imperfect secretion of the liver and other intestinal organs, the whole phenomena in fact of that state of the circulating mass. This play of affinities be-

tween the circulating blood in the capillary bloodvessels and the changing tissue, the fibrilla of the muscles and the nervous structures, engaged in muscular exercise, is the starting point, I think, and a sufficient basis upon which we can found a rational and I hope not unprofitable explanation of all the phenomena observed.

In the composition of the blood are contained all of the separate ingredients of all the tissues in the body either elaborated, so as to immediately enter into the composition of these tissues while passing them in the capillary tubes, or to be readily and easily changed by the chemical or vital affinities, or both, of the organs to which they are appropriated. These ingredients must possess distinctive differences to a certain extent at least, so that we may say with great propriety, that in the blood are contained muscular fibre, nerve fibre, bile, urine, bone, and so on to all the products of functional action and nutrition, either ready formed, only awaiting separation, or formed, requiring elaborating mutation by means of cell action, to be appropriated as needed, for the formation or repair of structures. Another proposition forces itself upon our mind in this connection as necessarily true, viz: that these ingredients must exist to a limited extent of quantity only and something of definite proportions to the probable wants of the various organs used, owing to the habits to some extent of the individual. The man, for instance, whose muscle is called into action to a greater extent than any other system of organs, will require more food from which muscle tissue may be formed, and his chyloferous and sanguiferous peculiarities will be that of muscular elaboration, those organs will become large and be kept in a state of perfect nutrition, at the expense perhaps of the brain. Individuals, on the other hand, whose functions are mental exclusively, will have an abundance of neurine in the blood ready for use, while the muscle cannot be nourished to such an extent as to admit of more than very moderate muscular exercise. We often have examples of partial impoverishment of the blood of this kind brought about by habits. If the man of muscle was called upon to exercise his mind long and intensely, he would soon have the headache, lassitude and exhaustion, in

fact as readily become exhausted with this kind of unaccustomed effort as the brain worker would if required to labor actively at anything that required muscular exertion. These habits and capacities may be at least partially changed by gradually bringing about different habits in the two individuals, and with it different sorts of nutrition and the necessity of different diet. It must be remembered that all these ingredients, intended for different purposes, are thoroughly mixed together and circulate in company to all parts of the system, so that through the capillary vessels of the brain we have the neurine with the muscular, bilious and other materials, instead of the neurine alone. The affinity of the nerve fibre for its peculiar material of support, through the agency of cell metamorphoses, takes up from the blood its own nutritive elements and leaves the other ingredients to pass along and be elsewhere appropriated for other purposes. Of course it is supposable that only just so much material is abstracted as is needed for repair and growth and no more, and if the blood is still rich in such ingredients, much of them pass on to be returned in the general course of the circulation. In like manner the material for the formation of muscle is arrested and appropriated as needed, as with every other peculiar material. The more actively the function of any organ is proceeding, the more rapid is the play of affinities between its intimate structure and the blood in the capillaries. The blood, by means of the attraction of the acting organ in its atomic changes, is attracted into the capillaries in increased quantities, the attraction being always from the arterial extremities of these minute tubes. It is thus drawn from the arteries by this attractive force. So soon as the chemical or vital changes have resulted in the repair of the acting structure, this artero-tissual attraction ceases, but now there is thrown into the stream of passing blood the effete material resulting from tissual disintegration, where there is another force developed, a kind of tissue-venous repulsion which urges it forward in the veins. These are the main elements of force in the capillary circulation, the attraction of interstitial and separative nutrition and the repulsion of interstitial disintegration and distinction. Now to justly estimate the effect of these forces, it will only be necessary to recollect that the tubal

area of the capillary vessels, compared to that of the arteries whence they are supplied with blood, is four hundred times larger. Hence, if nutritional attraction is feeble—which it certainly is—when exercised by a single cell, it becomes enormous when billions of them combine in pulling in the same direction. In fact, I have sometimes fancied that if all the organs could act simultaneously through all their capillary vessels, so much blood would be thrown through the veins upon the heart as to burst it from excessive accumulation. If, on the other hand, all nutritive attraction were to cease, the blood would accumulate in capillaries, cease to evolve caloric and the circulation to stop. Indeed, it is quite probable that such is the condition of things in extensive congestive collections in different parts of the body, or of a general character. In cholera, in which there is general congestion, this seems to some extent to be the case. The blood stops in the capillaries and passes through them with great difficulty, either on account of its altered condition or the arrest of nutritional changes going on necessary to keep up the circulation, the watery portions transude through the skin and mucous membrane, while there is a complete want of response to medicinal appliances, as though the functions of the stomach, both absorbent and digestive, had entirely ceased. In repose, or an accustomed degree and kind of exercise, the capillary flow of blood is such as to keep up a pulse, say to 75 or 80 beats the minute. In walking or standing, in persons accustomed so to do, there is very little acceleration of pulse, but when a larger number of muscles than usual are put into operation, the increased area of capillaries are being acted upon by this nutrition affinity, and consequently a larger amount of blood is poured into the veins and thence into the heart, which is stimulated to greater exertion and also the whole circulation. The relative affinities between the blood and the tissues may be increased therefore by an increase of function in the latter; the more active a muscle is contracting and relaxing, the more rapidly its changes of disintegration and repair is going forward, the greater amount of nutritive material it is attracting from the blood. In persons whose blood is rich in albuminous material for the support of muscle, the less will be the arterial

excitement—other things being equal—because the muscles derive their pabulum from a less quantity. If, however, the blood is impoverished in the material necessary for the support of muscle, it is drawn through the capillary vessels more copiously, in order they may receive the same supply. This explains the exciting effect of exercise in anemia. The capillaries must pass a large amount of impoverished blood through the muscles, or a large amount of it is passed through quite rapidly in order that they may derive material for their repair. This being poured into the veins, it goes more rapidly than ordinarily into the heart, which is very excitable, and it is thrown into tumultuous action. There are many good reasons deducible from experiments and observation for believing this to be the true explanation of the physiology of exercise. The mechanical effect of the muscles in pressing the blood forward toward the heart—for on account of the valvular fixtures in the veins passing through the muscles, they cannot press it backward—by squeezing the vein between them, has been supposed to, in some measure, account for the acceleration of the circulation of the blood, and the sweating, heat, etc., to be the effect of the latter phenomenon. But, as I shall show from experiment, this cannot be an explanation in all cases. The secretions and excretions seem to be stimulated to an increase by the mere presence of the ingredients forming their products in a more than ordinary quantity. The kidneys may be stimulated to increased action by a more than ordinary quantity of water in the blood, and by medicinal agents in the circulation. The proper office of the excretory organs, however, is to carry off the waste sustained by functional action in the active organs. They attract the materials of secretion in their capillaries from the arterial extremities of these tubes, and thus may add or produce arterial excitement just as functional action in other organs may do the same. The mere transudation of water through the skin and mucous membranes of the alimentary canal or kidneys as not forming a part of the cell action in secretion, must be considered an exception to this rule. A prominent example of this kind of excitement is the secretion of sugar by the kidneys. Diabetes is always attended by increased arterial excitement,

and yet post mortem examinations have not revealed any peculiar inflammatory lesion to account for reaction. In fact, I think we may regard it as a rule, that increase of function above the natural standard of activity involves an accelerated circulation, greater or less according to the circumstances of the case. Exceptions to this rule possibly may be summoned by the memory of some of my friends here to-night, but they do not just now occur to me; and further, the longer functional action continues, the greater will be the velocity of the circulation. This constant increase of circulatory velocity is dependent upon one of the circumstances mentioned above, viz: the definite amount of ingredients intended for the support of functional activity in each organ; something like a definite amount of material for the repair of muscular structure during its acting condition. This substance in a state of preparation is diffused throughout the whole circulating mass. After the process of repair has been kept up during muscular action for some time, the quantity will become lessened, so that the blood to some extent is impoverished of this particular class of ingredients, and a greater amount of blood must be circulated through the muscular fibres in order to impart to them an adequate amount of support,—just as a larger amount of unnutritious aliment is necessary to impart the nourishment that a smaller quantity would afford if more concentrated. This decrease of material and increase of excitement bear a direct proportion to each other, until the blood becomes so much exhausted as to be incapable of supporting the organs under further exertion, when the exercise must cease; not from damaged condition of the acting organ, but from the exhausted condition of the blood. The most interesting proof of this theory of the physiology of muscular exercise is derived from the effects of muscular contraction without motion of the limbs, such general contraction of antagonising muscles as to prevent motion. It will be found by experiment that when an individual is sitting at apparent ease, if he places all the muscles of one lower extremity in a state of great contraction, from the hips to the toes, that his pulse will be accelerated from twenty to twenty-five beats in the minute, and of both lower extremities some ten more. By

simply holding one arm horizontally, it will accelerate the pulse from four to ten beats.

I have tried a great variety of experiments of this kind, and I find the larger number of muscles, and the more violent the contractions, the greater the arterial excitement. I have very little doubt but that one half of the soft parts of the whole system in weight is made up of the muscles and their appendages. If this be a true supposition, the area of their capillary vessels is two hundred times larger than the whole of the arteries in the body, and it is not to be wondered at that a small increase in the rapidity of the current in an area of nearly a hundred fold more tabal space—as one leg and hip—should cause perceptibly increased action of the arteries. Another fact of no small importance to the physician deducible from the experiments I have performed and witnessed of this kind is, that this static muscular contraction produced more effect upon the action of the heart and arteries than locomotion. I think this results from the circumstances that the muscles of the legs in locomotion are not all in a state of contraction at the same time, but alternately contract and relax, one set carrying the limb forward while the other set is relaxed. There is yet another remark I desire to make about the physiological action of muscles. Although the body of a muscle may be continued tense for a considerable time, the whole of the fibrilla are not in a state of unvarying rigidity, but the organ, when closely observed, will be seen to tremble and twitch in small portions, each portion being in a different part every instant of time, and upon auscultation the contraction and relaxation of the fibrilla composing its bulk may be heard very plainly. There can therefore be no doubt that a part of the fibrilla are contracting while the others are relaxing and repairing, ready for another contractile effort. For an instant, in a jerk or sudden start no doubt, all the fibrilla may act in unison, and those are the overwhelming contractions that snap asunder the tendo-achilles, or the muscles themselves, or back bones, etc.; but such contraction cannot be maintained even for a moment. Only a part will act at a time on a strain, and the longer the stretch the more ineffectual and feeble this general contraction becomes.

PATHOLOGICAL EFFECTS OF MUSCULAR EXERCISE.

As with every other condition and circumstance which may produce disease, the effects of muscular exercise will vary, and its ultimate morbid action will depend upon many things. Constitutional proportions of the different organs of which the body is composed will modify the effects of exercise, as also the different conditions of them. The tumultuous effects of violent exercise upon persons laboring under pulmonary and cardiac affections would be easily predicted. Dyspeptics, from their incapacity to digest, assimilate and repair the waste resulting from the wear of protracted muscular action, would soon succumb to their exhausting exactions upon nutrition. Persons too whose kidneys, skin, or other emunctories are so damaged as to perform excretion imperfectly, soon poison their own blood to such a degree, under voluntary exertions, that they are soon arrested. Climate has much to do in enabling man to undergo great fatigue without damage. The tropics are peculiarly averse to great and protracted physical labor, probably on account of the air being so rarified as not to oxygenate the blood sufficiently in quantities respirable by an ordinary pair of lungs. Extremely cold climates, although affording oxygen in compact manner, is probably so sedative in its influence as not to be most favorable to enterprise. Experience proves to us what sound physiological knowledge would suggest, that the temperate is much the most favorable zone for man and the enterprises of civilization. All the circumstances necessary to enable man to do more work without damage to his physical system are here combined in that happy manner, as not only thus to capacitate him, but to stimulate him to ambitious and profitable industry. Diet is another one of the most certain modifying circumstances in this respect. Impoverishment, debility, and organic evil is sure to work destruction upon the unfortunate laborer who lives on insufficient fare. Nor can we leave out of the question habit. Laziness incapacitates man for labor, and it would be almost certain to make a lazy man sick to commence hard labor upon any sudden emergency; and we seldom see people physically capable of field or mechanical labor who have led a life of indolence up

to mature manhood, and if by mental discipline they force their muscular system into laborious employment, the effects are disastrous in the great majority of instances.

In order, however, to arrive at the proper morbid influence of exercise, we must observe its effects under all the circumstances in which man is placed, while also we bear in mind the degree and kind of exertion.

It will probably be best to commence with a consideration of the acute effects, if I may use the expression, of violent efforts, and afterwards take a view of the more gradual inroads upon health made by protracted toil. Violent muscular contractions often cause tendinous ruptures, as in the case of the tendo-achilles, an instance of which my friend, Dr. C. G. Smith, mentioned to me recently as the result of violent muscular efforts in dancing, as also hernia, etc. Rupture of their own substance: a very interesting case of this accident occurred in the practice of a friend of mine several years ago; the rectus abdominis tore across about the junction of the upper two-thirds with the lower third. Bloodvessels have also been ruptured, and fatal effusion in the brain, chest, or abdomen, the consequence. The heart itself, a powerful muscle, may be lacerated by the distending influx of blood, an instance of which I once knew in the case of an athletic man standing under a heavy load. The patient staggered, fell with his load and never rose. Upon examination, his heart was lacerated and his pericardium distended with extra cardiac blood. Thousands of such disasters are constantly occurring as the accidents of muscular exertion, but it is with the less direct influences that we are now most concerned. It may not be irrelevant, perhaps, to consider for a moment what fatigue is, what its character, and what its import. I mean by fatigue that muscular inconvenience, dependent upon over exertion (local) in the muscles of the legs when it has arisen from walking, in the arms when they have been the members used, etc. This local fatigue is, doubtless, the result of increased vascular action in the parts the capillary vessels have been and continue to be more than ordinarily distended with blood, in order to keep the parts properly supplied with nutritive material, and is caused by the nutritive affinities in the tissues. When

this increased vascular action is continued for any length of time, it may become local inflammation and not pass off by rest merely, particularly when other circumstances favor such a state of things. The lungs may also become the focus of local irritation and inflammation as the effect of excitement from exercise. The brain, in fact most of the important viscera, may be thus affected, but I think by far the most morbid effects of exercise are indirectly produced from it. The suppression of excretions, rendered more active by exercise, is a source of aggravated difficulty, if not a primary result of the excitement of exercise. In order to elucidate the idea I wish to convey, I will mention a few facts that are known to exist. During active exercise the blood is loaded with excrementitious substances, as carbon, urea, or its proximate principles, etc., and these are finding outlets through the exhalations from the lungs, skin and increased urinary discharge. The dupurating process is commensurate with the necessities for it, and the blood is maintained in such a condition as is necessary for the support of the vital and nutritive processes of the system to a healthy degree, each emunctory having its own peculiar effete substance to eliminate, and when not interrupted, all goes on well; but should one or more of these emunctories fail to perform their duties, some of the excrementitious substances fail to find their way out of the bloodvessels, and being retained in the mass of blood, to a certain extent poison that fluid, and render it incapable of performing all its complicated offices. This is the reason why suppression of cutaneous excretion proves so disastrous, when the individual is laboring under the wearing effects of violent exercise. We know from experience that it is not simply the stoppage of perspiration, for if perspiration induced by heat be stopped, the effects are not nearly so disastrous as if produced by violent exercise. The excrementitious contents of the blood are smaller in quantity and perhaps less poisonous in character. It should be remembered, however, that there is no time, even in the most calm condition of the functions, but what excrementitious substances do exist in the blood, to an extent of quantity sufficient to prove deleterious to the organism if detained by suppressed excretion. I think it is thus our most

violent inflammatory diseases are produced. I desire to be understood as not denying the repulsive effect of suppression of excretion. This is often effective, I have no doubt, in the production of local determination, but I do wish to make a distinction between this effect and the retention of morbid excretion. I wish also to say that much stress is due to the time—in relation to exercise—when this suppression occurs, as to the gravity and direction of the effect produced.

Its chronic effects upon the muscles are well known. It almost invariably results in hypertrophy. The muscles concerned become larger and capable of more than usual power. And no doubt but that nutritional increase may be carried to a great extent if everything else favors. The most interesting, however, is the chronic effects upon the blood, and through it upon the organization at large, or some particular organ or group. This subject has not commanded the attention which ought really to attach to it, and hence there is not much known as to what the effects of excessive muscular exercise, continued for a long time, would be. The instances which usually fall under our observation are such as are combined with privation and often other deleterious influences, so that we cannot separate the evil of the various causes. Excesses in this way, however, must lead to changes in the composition of the blood, abstracting, on the one hand, the material for their support, and thus, in one sense, impoverishing it; and on the other, pouring into the blood excrementitious substances evolved by muscular detritus, and thus injuring its composition. There can be no doubt that exercise for days, without the proper intervals of rest in this way, very much impairs the quality of the circulating mass, and produces morbid determinations, often to the brain, lungs, abdominal viscera, etc. I think there are many reasons for believing that the blood cannot elaborate the materials of digestion poured into it through the stream of chyle, derived through the chylopoietic organs, without some intervals of rest; that the several hours rest of night afford the blood time to recover from the exhausting influence of the exercises of the day; that sleep is a blood repairing process instead of an organ repairing interval from labor. The first effects then of protracted labor would

be impoverishment of the blood of certain substances intended for the support of the laboring organs, an increase of the velocity of the circulation, in order to compensate in quantity of blood for the want of richness, until it amounts to morbid excitement, and with local determinations to the organ operating. This may proceed so far as to induce inflammations of the muscles of the brain, etc. The great exertion necessary on the part of the central organ of circulation will induce hypertrophy, with all its evil effects upon the lungs, etc. In a more moderate degree, exercise, to too great an extent compatible with health, would cause simply functional derangements, from the changes of the blood I have just mentioned. The abstraction of certain elements from this fluid must prevent its chemical and vital reactions from taking place normally, in such a way as to keep up any of the functions correctly. I cannot forbear, although it may be not strictly in place, to consider, in this relation, the effects of want of exercise in a short way. The immediate or early effects of inactivity, as observed by the medical man, is in most instances plethora and often local fulness, particularly of the head, scanty secretions and excretions, costiveness, loss of appetite, etc. This condition of things is often followed by depraved secretions, the tongue is coated, various nervous symptoms show themselves in general *malaise*. There is always felt a strong desire to move about, the muscles must be stretched, with yawning and gaping. Now the symptoms of disease that occur as the effect of want of exercise, is very different from those, the result of excesses, in this respect. Excrementitious materials are not retained in the blood, hematotoxy does not take place, but there is too great a production of nutritive materials for the organic expenditure, and if digestion remain good and hematization is efficient, more albumen is elaborated than the muscles and nervous system consumes, a larger amount of corpuscles, white and red, exist, than is necessary for oxydation and repair. There is too rich a condition of blood for the meagre demands. The acute effects of this real plethora is to embarrass most of the functions, produce hemorrhages, apoplexy, epistaxis, hemorrhoids, etc. The sudden transition of persons in good health, from an active mode of living to that of seden-

tary habits, very often lead to diseases of a plethoric character, highly dangerous and often fatal. I will digress here long enough to say that we should always discriminate in local disease, between those arising from suppressed secretion, and consequently in systems possessed of poisoned blood, and those coming up in case where plethora exists, from acute plethora developed in recently assumed habits of inactivity. I think the illustrious General Taylor is an example of the fatal influence of such a change of habits. Doubtless, such instances of disease would bear depletion far better than those originating in other causes.

But supposing that these acute effects are not developed, and the habit of inactivity and its consequences continue, what are we to expect? Now, I consider this one of the most interesting points of pathology, and I regret that the state of our knowledge and my own deficiency of information on this point, prevent me from doing justice to it.

I shall, however, say, in a very brief manner, such things as my experience and reflections enable me. If the opinion I have expressed above be true, that the blood is the great laboratory in which the nutritive materials are prepared ready for their immediate uses, and that each one of these ingredients are prepared in a definite quantity and of separate quality, as for instance such as are intended to repair the muscles, such as go to supply the wear upon the nervous system, etc., and that in order to be readily excreted they must be used for such purposes and cast off as refuse matter, it must follow that these materials will vary with the draw upon them by the acting organs.

I do not assume that ingesta may not be excreted without first passing through these respective structures, but that it is at least unnatural and unusual, and doubtless often gives rise to embarrassment in the secretory and excretory apparatus through which they pass. I believe, too, that many of these different ingredients, after being thoroughly prepared for use, are retained, and raise the albuminous compounds to a higher relative proportion than normal. This, at first sight, would appear of little consequence, but upon closer examination I am induced

to believe that a class of the most obstinate and fatal affections arise from, or at least their cause are made more effective by sedentary habits, and habits of inactivity. I allude to scrofulous and tuberculous disease, which I think ought to be classed together. My accomplished friend, Dr. J. N. Graham, at my instance, commenced a series of experiments upon dogs, to see how absolute confinement in a close box would affect them, so that they could not turn around or in any way exercise their limbs, and yet have a good supply of pure air and good food. Although these experiments were not so numerous and varied as to justify positive conclusions, they unquestionably produced the very best specimens of tubercous infiltration in the lungs, as also some of the other organs. These lungs may be seen at his office in Portland Block, by any member of the society who choose to call and examine them. The effect was so complete, and resulted apparently so entirely from confinement, that he is equally with me of the opinion that they stand in the relation of cause and effect. This opinion is strengthened by the fact, that the wild animals caged in the different menageries and zoological gardens die almost invariably from tuberculosis. Observation on the human patients, I think, still fortifies the conclusion. The robust hunter and frontiersman or his family scarcely ever have scrofula or consumption. I have not time and space in this connection to adduce any further evidence of this kind; but I believe reflection on what you have seen, and observation in future, will furnish you with numberless examples of this kind. And this is quite in accordance with physiological laws. Before reminding you of these, however, I will mention a fact with which you all are no doubt familiar: that tuberculous and scrofulous deposits belong to the proteinous compounds, and are identical in chemical composition with these as found in the blood in the shape of albumen, fibrin, etc. Now, the physiological laws to which I have alluded are, 1st, that when an ingredient becomes redundant in the blood, it has a tendency to effusion in the tissues, or completely out of the body; and, 2d, that when an effusion in the tissues takes place, the fluid portions are absorbed, and the solid, becoming compact, act as irritants, and are discharged by suppuration—instance apo-

plexus, etc. Now, I think, this is just what takes place in tuberculosis; the albumen, which is elaborated in and through the blood, becomes superabundant, because not used by the muscles and nervous system in a state of inactivity, and is effused in the tissues in the shape of tubercles in the lungs and cheesy deposit elsewhere.

Two facts somewhat relevant to this theory is, that in tuberculous persons the proportion of albumen is highly preponderant, and that the chemical composition of muscular fibre is that of albumen. Other causes augment the tuberculous diathesis and determine the location, shape and time of deposit. Irritation from cold would cause an unusual collection of blood in the lungs, and encourage the deposit in them; intestinal irritation would produce the same effect in concentrating the fluid and deposit in the abdomen; premature or morbid excitation in the cranial cavity would induce tuberculous meningitis. May I not also claim the broken-down tuberculous condition, developed by long confinement, from serious accidents, as fractures, crushed limbs, etc., as confirmatory evidence of the theory? But I am prevented by time from discussing this interesting branch of the subject farther. However, I hope, as cultivators of our beloved science, you will examine it with sufficient patience to confirm or falsify the conclusions to which I have been forced by the weight of facts, as I have seen them.

This disturbance of quantitative and qualitative composition of the blood acts in other directions deleteriously. The right composition and relative abundance of separate constituents of the blood are indispensable to the correct physiological action of any of the organs. Hence, we find that indigestion from depraved or insufficient gastric and intestinal secretion, almost invariably attends great inactivity. What digestion does take place is so imperfect as still further to deprave the composition of the fluids, and add to the tendency to organic trouble. The liver, pancreas, and in fact all the glandular apparatus, either become torpid merely or depraved in their action. This indigestion and torpor of the abdominal glands are sometimes alternated with copious effusions in the intestinal canal and diarrhea, as we see in chlorosis and other affections of this sort.

In this general depravation, the nervous system suffers its share. Cephalagia, neuralgia, and neurotic phantasies of all sorts and of the most distressing character, generally accompany this condition of things. The nervous symptoms sometimes assume such prominence as to mask for a time—and I am not sure if they do not postpone other—more disastrous evils to which the patient is tending. Want of exercise has another more direct and positively deleterious influence on the inactive organs. We will be able to appreciate the force and direction of this evil influence best, by recurring to examples of extreme degrees of inactivity. All of us must have observed the great muscular debility with which patients arise from a long confinement, by serious accidents; how long it requires for muscles of a broken limb to regain their wonted vigor, and command of the member, and how much the faculties are all obtunded by the absolute confinement and inactivity of prison life.

It may be stated, I think, without any suspicion of its correctness, that no organ can exist without functional action. They are not developed in animals of corresponding species where they are not needed. The fishes of lightless caverns of America have no eyes, and yet they cannot be proven to be different in any other respect from the fishes in the neighboring external brooks. And I do not hesitate to believe that the sixth generation of human beings confined to an entirely unlighted cavern like the Mammoth Cave, would produce blind offspring. The second having less perfect organs of vision than their parents, the third still greater deteriorations, and so on until the eyes would be merely rudimentary. We have no examples that I am aware, of any of the higher order of animals ever having been submitted to such trial; but I think the inference justifiable, and therefore venture to express it.

The entire inactivity resulting from paralysis is succeeded by complete muscular atrophy—not merely want of energetic nutrition from nervous influence, but structural alteration; the muscles lose their fibrous texture and degenerate into masses of areolar tissue, so that no amount of stimulus is sufficient to cause them to contract. The probability is this, muscular atrophy is one of the greatest obstacles to cure in paralysis.

We cannot account for the cure of muscular paralysis by electricity upon any other principle than its stimulus upon the muscular fibre directly, and their increased capacity therefrom. The more susceptible and powerful the muscular fibre, the less nervous force is necessary to cause contraction. We do not, cannot suppose for a moment, that electricity or galvanism can add to the amount of nervous force, it merely supplies its place temporarily, until the disease which produced the lesion has passed by. Some very valuable practical lessons may be deduced from this consideration of the facts as above stated. The first is that there is no danger of beginning with our electrical stimulation too soon. The stimulation of the muscular fibres by the local application of electricity is necessary (not only useful but necessary) to the preservation of their capacity to act when the nervous stimulus may be restored to them. There is no danger of exhausting their excitability unless we use it imprudently strong. And I insist, that much of the failure resulting from a trial of electricity in paralysis arises from neglect to stimulate the muscular fibres, until their capacity for action is damaged. I am aware that this is not in accordance with the teaching of the majority of authors, as I might show by quotations if I had time, but I hope the members will pardon me for thus plainly stating my convictions.

THERAPEUTICAL INFLUENCE.

It cannot be doubted that exercise, producing as it does such extensive physiological and pathological effects, may be turned to therapeutic advantage. Its general effects are depurative, alterative and catalytic. I have probably shown sufficiently already the manner in which it is depurative: by promoting secretion and excretion, and thus casting out of the blood, through these emunctories, such effete substances as might be detrimental by their presence. I hope it will not be necessary to dwell on this point to any greater length. It is alterative by being depurative and tonic. It changes the direction and character of morbid action by equalizing the circulation, sending the blood with more vigor through capillaries in which it has been stagnated by congestion, and depleting in a peculiar manner by secretory evacuation. In this last respect we may

instance the good effect a hearty commotion of the chest by laughter has, in producing mucous expectoration and relief from constriction, that had previously existed, and the good influence on some diseases of the skin. But still another general effect which I term catalytic, for want of a better term, has a great influence upon the well being of the physical and mental system of man. It is a reacting influence of the different constituents of the blood upon each other, brought about indirectly by exercise. Change in organs produces change in the constitution of the blood, and thus renders it more adapted to the normal nutrition of other organs. If the muscular system remains quiet, the decomposition of certain compounds in the blood containing its nutritive principle does not take place. These compounds may, and probably do contain, in some chemical or vital condition of cohesion or attraction, the principle for the sustenance of some other system of organs, the nervous, I will say, for illustration. But these latter, although present, may not be in a state for appropriation until the former is separated by the muscular nutrition. The play of nutritive affinities between the blood and any of the tissues cannot be perfect unless it be good in all. If there is a failure anywhere in the great circle of nutritive assimilation, constituted by the complete variety which make up the whole system, it is felt by all more or less. Indeed, it is almost certain that the development and perfection of hematosis depend, after the chyle is received into the vessels, upon the influence of all the organs as the blood circulates through their capillaries. In this view of the subject, we see that hematosis is not effected by themes enteric glands, lungs and liver, or any other special set of organs, but is the effect of the co-operation of all the tissues, each contributing to the perfection of the process, by abstracting from and adding to the mass in the general round of circulation. The mesenteric glands, no doubt, impresses upon the chyle some influence in composition and change that is indispensable. Their effect is not only indispensable but peculiar: it is thrown into the blood, mixed and circulated by the heart, passes into the lung to undergo change, which can be effected nowhere else. In the course of its general round it is received into the spleen, where

cavernous formation has also a specific effect upon its composition and fitness for use. The liver, with its double circulation, contributes another touch of perfection to the changes already commenced; thence this fluid carries with it a condition not before possessed and acquirable in no other organ, and as has been imagined, perhaps the thymus, thyroid bodies and supra-renal capsules, all contribute in their own way their own impressions, each distinctive and unlike the other; but after all the generally considered processes of sanguification are complete, this blood would be unfit for all its purposes until it had been peculiarly impressed by the cerebral or nervous, the muscular and other tissues. Now what one of these tissues produce a state necessary as precedent circumstance to the changes which succeed in other points, cannot be said with any degree of certainty. But the stomach must not fail in one small particular, in performing its (the) first duties in assimilation; the mesenteric glands, the lungs, the liver, all must act just right; the muscles must act; there must be cerebral, in fact, every variety of functional action, or the blood degenerates in composition and becomes unfit for perfect support to any one of the series of organs. When there is nervous derangement or disease, the blood is deranged in quality and the phosphates are eliminated by the kidneys in more than ordinary quantities, while all the functions are disordered. If the muscles are diseased, as in rheumatism, acid to an inordinate extent may be discovered in the excretions, while the system is disordered in every respect. The kidneys excrete urea under muscular exercise in larger quantities than when in repose. Sedentary and studious habits give preponderance to the phosphates. I have been led into this train of reflection in tracing the mutual influence of one organ upon another through the blood, to exemplify my meaning of catalytic effect (or the decomposing effect) of exercises. I think it shows the necessity of the decomposing effect of one organ to the composing influence of the blood upon others, and that as every cell selects its own peculiar substance and prepares the fluid for another step in development, so does each organ by selecting its own peculiar nutritive properties from the blood, prepare that fluid more completely than it could otherwise be for the sustenance of other

organs. Now the general therapeutic effects of exercise in this direction, I think, will be apparent from the above observations. We must enforce muscular exercise when practicable at all, as a conservative measure—a measure to sustain the healthy condition of the well organs. There is no doubt that many serious forms of disease arise from a want of observance of this rule. Many of the derangements referable to the above explanation of facts are called sympathetic derangements. The muscles do not appropriate the substance intended for them, the blood retaining it, and is unfit for the formation of gastric secretion of a perfect character, indigestion results; the secretions from the bowels are slow, costiveness follows, etc. We cannot deny that costiveness and indigestion is the effect of want of exercise, the only difference is the manner of explaining their connection. Want of exercise deranges all the secretions and excretions, they cannot be healthy under a state of absolute confinement, and I think the reason is because the blood is changed, or rather is not sufficiently changed for the perfection of these processes. The special therapeutic effects of exercise are very numerous and varied, and depend upon the kind of exercise, and I will give them more particularly in another place under the head of special exercise.

The kinds of general exercise most in use are carriage, horse and foot. Exercise has also been separated into active and passive, but this is not a strictly correct application of terms, for if there is muscular action at all it is active, and without such action I should not use the term exercise in connection with it. Carriage exercise is a very gentle, or may be made very gentle exercise. The only muscular exercise in carriage riding is the amount of effort necessary to retain position. If sitting and the vehicle is conducted over rough roads and driven pretty rapidly, it becomes very fatiguing on account of the large number of muscles called into play, and the frequency of action necessary to keep position, and may produce a greater general effect, depurative and alterative, than walking. Horseback riding, however, is justly considered the most profitable, because the most varied of any of the three sorts I have mentioned. It calls into action a larger number of muscles

simultaneously, perhaps, than any other. The bracing in the stirrups calls into action all the muscles of the lower extremities, those of the back, chest, abdomen, in fact, the whole trunk, including the neck, are employed in maintaining the erect posture, under the varying relations of the centre of gravity; while those of the upper extremity are constantly required to guide, check and otherwise control the animal. Now all the conditions necessary to make this a trying and very fatiguing process is to have a rough gaited and spirited horse. On account of the large number of the muscles employed, and the constant and active efforts required to perform the great diversity of movements, horseback exercise has more general influence than any other with which I am acquainted. It has almost a positive control over deficient secretion and excretion. Indigestion, torpor of the liver and bowels, without organic disease, cannot exist on horseback. It has a very happy effect upon many general affections, by equalizing the circulation, promoting the secretions generally, and energising digestion and nutrition. I know of no one means so subversive of cachectic habits, either with or without organic disease, if it can be borne without immediate detriment, as horseback exercise. An hour a day, ten miles, or any other precise quantum, will often fail, when it will succeed if used to the extent of endurance. If capable, the individual should be on horseback constantly; at any rate, as much as possible. In consequence of the depurative and roborant effects, I look upon it as one of the very best means of preventing and even curing in the early stages of tuberculosis. But in the advanced stages of consumption, it is too fatiguing, the system has lost its capability for enduring so much muscular action, and of course it is not available. It would be foreign to the objects of this paper to go into minute detail of the applicability of this kind of exercise to all the diseases in which it is found to be beneficial. Exercise on foot, or walking, as a therapeutic and hygienic measure, is not as highly appreciated in this country as it is in Europe, particularly in England. The pedestrian feats of many English ladies would, if related, astonish their fair sisters of this country. No doubt much of the robustness of frame and

beautiful color of the English females depend upon this salutary habit of walking several miles *every* day. A little wet weather or a bleak wind does not prevent this practice—it would be as inexcusable to neglect the daily walk as the neat toilet exercises which always precede it. Walking is, although more fatiguing than riding on horseback, a less healthful exercise. It is more fatiguing, because some particular muscles support the main burden of the exertion, while others are comparatively at rest. It is less salutary and healthful, because so large an amount of the muscle are not in action as on horseback, and hence the amount of blood change is less;—all the general effects of exercise, however, are to a greater or less extent realized from walking. It is more available than either of the other sorts, because less expensive, and may be practised in less room. Although the influence is much enhanced by open air exercise, yet much valuable results may be brought about in the sick chamber by systematizing this kind of exercise; and in convalescence from acute disease, or in some chronic cases that will not bear exposure, we should not forget it. There is also a kind of exercise too that is available to the poor prostrated bedridden patient that I doubt not may be advantageously used on certain occasions. I allude to what I call static muscular exercise. It consists in the voluntary contraction of the muscular fibres of the limbs, so as to retain them in the position they happen to be placed. The patient with a broken limb, who cannot rise for fear of displacing the adjusted fragments, may thus draw all the fibres of the sound limb tense, and keep them so, or alternately relax and contract them as he may be able to bear it, until all the general effects of muscular exercise be produced, and manifested in the secretions, excretions, appetite, digestion and good health generally. I have no doubt that if patients were rightly instructed and attended to in this respect, many of the broken down constitutions, with which patients often arise from the effects of severe accidents to the extremities, would be prevented. No man can appreciate the powerful effects of this kind of exercise without some experiments upon the subject. I have already alluded to its effects upon the pulse; it also induces perspiration, diuresis, fatigue, hunger,

and all the effects of muscular motion. In fact, there is more danger of over exerting the muscles in this way than walking or riding, for in the static exercise of the muscles all of these organs are acting at the same time; in walking, a part of the muscles of the leg carries the foot forward, while those on the posterior part are relaxed and resting; so soon as the foot is planted these muscles contract, and those on the anterior part of the leg relax. And thus they alternately relax and contract, resting half the time. It will be readily experienced that we cannot keep all the muscles of a limb in a state of rigid contraction but a very short time. The larger number of muscles, the greater the general effect. No man can hold all the muscles of the lower extremities in a state of forcible rigidity for two minutes, without blowing and sweating quite as much as if running or walking rapidly. It may seem probably, at least, impracticable to apply this kind of exertion for hygienic or therapeutic purposes, but certainly many patients are so situated that they cannot take any other sort, and their health must suffer. In these cases, I am satisfied, much good can be done in preserving and promoting energy of function in all the more essential organs by this static mode of affecting them. Besides these sorts of what may be called general exercise, because not necessarily confined to any set of muscles, there is what may be called special exercise, having reference to some part of the system; thus, by exercising the muscles of the arms and chest, it is expected that the lungs will be expanded beyond their former size; in exercising the abdominal, we may promote the action of the alimentary canal and quicken digestion; by dancing, we can enlarge and develop the muscles of the hips and legs; by fencing and boxing, the arms, and so on. Much may no doubt be effected in this way, which may be made useful under certain circumstances. Gymnastics, as practised by skilful teachers, is designed to be of general and special usefulness.

Although every studied motion and act has a special reference to some part of the body or system of organs, they are so numerous and so skilfully designed, as to have a developing effect upon the muscular system as a whole, by operating upon each part successively, while they have the depurating, excretory,

alterative and catalytic effects that are produced by general exercise. All young persons, who are too indolent and proud to work, and all others whose occupation is deficient in exercise, should avail themselves of this, as an excellent means of promoting their health. Occupations often involve the exercise of only a part of the muscular systems, and hence may be used under certain circumstances, therapeutically, for changing the current of circulation and strengthening parts of the organism; so that we should never lose sight of the excellent effect of a change of employment that may be brought about under certain contingencies. And I cannot but think that exercise by some employment, with the double object of pecuniary and hygienic good, is more effective when properly adapted to the case, than merely to take exercise for our health.

I cannot do more than merely allude to this view of the subject now on account of the limit of this paper. I may say in a general way in conclusion, that exercise in acute diseases, particularly inflammations, is scarcely ever applicable, absolute rest being the rule, and that it is to chronic cases to which it is most appropriately adapted. Acute cases, in fact, are nearly all injured by the arterial excitement which accompanies it, but after the acute symptoms to some extent have subsided, exercise will promote healthy action and assist in repairing the damage resulting from the force of the attack, and should be prescribed with as much care and discrimination as the more medicinal part of treatment. This will often be found as essential to the welfare of our patient as any other remedial measure. Many cachexia, no doubt, grow out of the anemic and deranged condition of the system resulting from the progress of acute diseases, and might be prevented by this and other roborant means during convalescence. Great care, however, will be necessary to avoid relapse from too much arterial excitement; the return to exercise must be gradual, and cautiously watched. There is probably no chronic disease in which exercise may not be employed as a remedy, and I think it is the principal curative means in many of them. On the lungs, exercise has a peculiarly good influence. They of course partake in the general catalytic operations, while they grow and enlarge from the increased demands made upon them for oxygenation of a greater amount of blood.

ARTICLE II.

REPORT OF A CASE OF EXTRACTION OF THE BONES OF A FETUS
FROM THE PERITONEAL CAVITY, AFTER HAVING BEEN
THERE OVER FOUR YEARS.

BY D. W. YOUNG, M. D., AURORA, ILL.

On the 17th day of August, 1855, I was summoned to visit Mrs. Phillip Youngels, a large and robust German lady, residing one and a half miles north of this city in what is called the *Big Woods*, whom I found in an advanced stage of labor with her second child.

She was already far advanced in labor when I arrived, and consequently required but few more pains to complete it.

The child, a large, well formed male, weighed some eight or nine pounds, and was strong and healthy.

After the child was born and the placenta removed, and while I was applying the bandage, she directed my attention to a tumor in her right side, situated in the iliac region, which she informed me had been there for something over four years, and gave the following interesting history of its commencement.

She says that while she was still residing in Germany, she became, as she supposed, pregnant for the first time; that she enjoyed pretty good health during the first six months of gestation, but during the latter three or four months she suffered quite a good deal of pain in her right side.

At or about the expected time for her confinement, pains came on, and she and her friends supposed that labor had really commenced, and accordingly called their midwife, who came, and after repeated examinations expressed her fears that the child did not *lay right*, as she could not reach it, and as it did not advance properly notwithstanding the severe pains. Her pains continued and increased until she says something burst and discharged a large quantity of water and bloody matter, together with clots of coagulated blood, after which the pains ceased; the tumor diminished in size and moved higher up, and farther to the right side. The final conclusion with them was that she had only suffered from obstructed menstruation which

had now been relieved. The lochial discharge continued for two or three weeks, during which time the tumor also diminished somewhat in size. But finally the lochial discharge ceased, leaving the present tumor, which to all appearance has remained perfectly dormant up to this time.

A few months subsequently she consulted her surgeon in relation to the tumor, who informed her that the tumor was most undoubtedly an ovarian tumor which could only be relieved by a very hazardous operation, which, while she suffered so little inconvenience, he would not advise.

She soon again became pregnant and in due time was delivered of a living healthy child. Parturition was natural and easy, and she soon regained her usual degree of health, having experienced nothing different from other parturient women under the circumstances, except an entire absence of the lacteal secretion. The tumor apparently remaining in the same dormant condition.

Some two years subsequently she again became pregnant, and in August, 1855, I attended at her confinement, which, as I have above stated, was uncomplicated and easy.

As the tumor remained, to all appearance, just as it had been for over four years, of course I advised no interference unless necessity should require it.

I heard nothing more from Mrs. Youngels until the first of May, 1856, when her husband called at my office to consult me in relation to his wife, who he said was very poorly. He informed me that some time after her confinement she was attacked with chills and fever, and that as his friend, A. W. Heise, M. D., a very eminent German physician and surgeon from Addison, Du Page Co., Illinois, was in the neighborhood, he called him to prescribe for his wife. Notwithstanding the medicine, the chills and fever continued; the tumor became painful, inflamed, and finally opened and discharged several small bones, one of which he exhibited, and I pronounced it the fibula of the right side. He said that he had that day written to Dr. Heise, requesting him to visit his wife immediately, and desired that I would see her with him when he came. I promised, and he returned home.

On the 5th day of May, 1856, I was summoned to meet Dr. Heise in consultation, who was then waiting at her house.

At my request, P. A. Allaire, M. D., of this city, was also called to examine the case in consultation.

The patient was very much emaciated, and seemed suffering from hectic fever and severe night sweats, together with extreme nervous prostration. The tumor near the umbilicus was ulcerated and discharging a *most terribly* offensive matter. After due consultation, and at the earnest solicitations and request of the patient, an operation was decided upon, notwithstanding her extreme emaciation and feebleness.

Accordingly, I put the patient thoroughly under the influence of chloroform, when the operator, Dr. Heise, proceeded with a grooved director and bistoury to make an incision of some inch or two toward the right side, and with a long pair of forceps commenced to extract the bones. The bones of the head and pelvis were too large to pass through the small orifice, which seemed as large as we dare make for fear of cutting beyond the adhesions of the sac and peritoneum, consequently they were broken up with a strong pair of scissors. This was a very slow and tedious job, as you will notice that the bones are perfect and fully of the size of an ordinary nine months' fœtus, and very firmly ossified, being as hard or even harder than the bones of an adult skeleton. Drs. Heise and Allaire took turns in operating, and were full two hours in removing all the bones and cleansing the sac. The patient was during all this time kept thoroughly under the influence of chloroform with the most happy effect. In fact, when the operation was completed, and she permitted to come from under its influence, she expressed herself as feeling decidedly better.

They succeeded in removing all the bones, together with a large mass of semi-decomposed matter, which was most indescribably offensive, from the sac. The sac itself was firm, dense, and so tough as almost to resist the scalpel, and was contracted closely around the bones. After the operation, the dressing consisted of a simple broad bandage around the abdomen, with directions that she be kept on her side so as to facilitate the discharge from the wound.

I visited her the next morning as per agreement, and found her comfortable and in the position we advised when we left her.

She was a little hoarse and complained some of her throat, doubtless from the effect of the chloroform. I removed the bandage, when the wound discharged quite profusely; reapplied the bandage and continued the same directions.

Things progressed thus favorably for four or five days, when I discovered that all or nearly all the fecal matter was being discharged from the wound and through the orifice of the sac, near the umbilicus. I invited Drs. Howell and Allaire to visit her with me. They both examined her thoroughly, and found as I had that the feces were really passing through the wound.

The plan of treatment instituted for this formidable complication was as follows:

I applied one large compress above and another below and close against the walls of the sac, then one immediately over the orifice, and then a broad bandage firmly applied over them around the abdomen, with directions that her bowels must *positively* be moved once a day either by castor oil or injections. I also gave her freely of good nutritious food with tonics, forbidding them to remove the bandage or compresses in my absence.

Under this plan of treatment, I soon had the satisfaction of seeing our patient improve very rapidly. The bowels soon moved regularly *by the rectum*, the discharge from the sac decreased, the sac contracted, adhesions formed, the orifice closed, and at the end of four months I discharged her perfectly cured from *all her pregnancies, ulcerated bowels, artificial anus, and all difficulties of whatsoever kind*, and up to this time, two years and two months, she has enjoyed excellent health.

[The bones referred to by Dr. Young, upon examination, proved to be: eleven ribs, two ulnæ, one radius, two humeri, two femurs, two tibia, two fibula, one scapula, one clavicle, two ilia, sphenoid, various and numerous fragments of bones of the head, etc., etc. Not a trace of the vertebra or bones of the hands or feet, among the lot sent, can be found. The bones are in a fair state of preservation, and quite as large as we might expect

those of a full grown foetus to be. There are several interesting points in this case to which I might refer, but I will only take the liberty now of mentioning one, that is the character of the pregnancy. I think there is quite sufficient reason to doubt whether it was a case of extra-uterine foetation proper. So far as the history is given (which I own is too imperfect upon which to base positive conclusions), it favors the supposition of rupture of the uterus, extrusion and peritoneal imprisonment of the foetus. I need but mention that the discharge of a large quantity of water, clots of blood and bloody matter, and the removal of the tumor farther up in the abdomen, are unlikely if not impossible phenomena in the spurious labor of extra-uterine pregnancy. It is almost as difficult, however, to account for the escape of the patient from fatal peritonitis under this supposition, as for the unusual circumstances above mentioned occurring in real extra-uterine foetation.

W. H. B.]

ARTICLE III.

A CASE OF FRACTURE OF THE LOWER JAW AT ITS NECK.

BY M. O. HEYDOCK, M. D., CHICAGO, ILL.

I was called upon the evening of the 21st of May to see Mrs. B. F. H., who had, I was told, just been thrown from her carriage and severely injured. Upon my arrival, I found that a fracture of the lower jaw constituted the only injury of a serious nature; the treatment of which is the subject of this paper.

The fracture was evidently at the base of the left condyle, crepitus was very marked and distinct, and deformity arose from a swaying of the jaw to the left, owing, as I suppose, to contraction of the pterygoid muscle. The fracture was easily reduced, the ordinary roller bandage applied, and cold water dressings ordered for the night.

Upon calling the next morning, I found that soon after falling asleep, displacement had taken place, and it was in the same condition as at first.

I now applied a pasteboard mould and the roller as securely as possible. The next morning I found that this had served the purpose during the day, yet during sleep displacement had again occurred, as in the previous night.

I now, with the approval of Dr. Freer, who had seen the case with me, had a spring made, partially encircling the neck, having a pad at each extremity, making pressure upon the left ramus and over the right articulation, hoping to counteract and overcome the action of the pterygoid muscle.

This acted indifferently well and was thrown aside. I now used one after another, starch binders, board and straps, and during the ensuing ten days almost every bandage I could find, approved by authors or suggested by friends. But each and every one failed me in my effort to retain the jaw in its place during the night, when voluntary control was lost in slumber. Two weeks had elapsed, displacement had occurred each and every night, crepitus was still as marked as ever, and pain on motion as great.

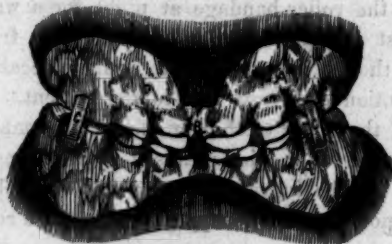
The prospect was anything but encouraging, a false joint seemed not only a possibility but a probability, unless by some contrivance immobility could soon be obtained.

I had exhausted my inventive resources in external appliances, and I now made a careful examination of the teeth to see if from them I could not obtain some hint which would assist me to accomplish the object I had in view. I observed that the upper central incisors were widely separated, and it occurred to me that advantage might in some way be taken of this peculiarity. A few hours elaborated the idea which had presented itself, and which was with the modifications to be hereafter mentioned, successfully carried out and executed.

The idea suggested was that a mould of the teeth of the lower jaw should be taken, running as far back as the molars, and from this a gold cap should be made which should snugly fit, and be securely and firmly attached to the teeth by clasps or otherwise. To this cap, at the point of separation between the central incisors spoken of above, a fragment of gold was to be attached, which should, when the jaws were closed, pass up between these incisors somewhat in the manner of a wedge.

If I am understood, it will be seen that if the cap retains its place, I have by the wedge-like process overcome the tendency to lateral displacement.

I now called upon Dr. Allport, a dentist of our city, and stated my project to him. He suggested that the pressure of the wedge, even though slight, and though not exerted during the day, while the jaw was under the control of the patient, might give rise to some soreness and irritation if continued as long as the nature of the case demanded. He proposed to overcome this objection, by fitting a cap for the upper jaw, similar to that of the lower, into which the wedge should be inserted, thus distributing the pressure. The two caps were then to be secured together by a couple of slender bars crossing from one cap to the other.



A A represent the two caps; C C the cross-bars connecting them; and B the wedge passing up between the incisors and hidden within the cap.

Impressions were now taken in wax, and the caps made after the same manner as the plates made by dentists for artificial teeth.

Upon placing the caps in position, it was found as we had anticipated, that the gold operating on a foreign body would not admit of a closure of the jaws. To obviate this, the opposing and impinging surfaces were freely cut away, exposing the crowns of all the teeth, thus permitting a close approximation of the jaws, and at the same time furnishing an outlet for the secretions which would naturally accumulate within the caps, and prove a source of annoyance and irritation.

The relation one cap would bear to the other was ascertained by placing the chin in position and directing the patient to bite

into a mass of softened wax, and while the caps were imbedded in the wax they were removed and secured in this relation by bars crossing in the neighborhood of the canine teeth of each side.

Dr. Allport now suggested that a thin layer of gutta percha should be placed inside the caps, which might, by its presence as a lining, prove less irritating than the plates alone, while at the same time it would more perfectly adapt itself to the inequalities of the surfaces than the metal. This, after being softened in boiling water, was placed within the caps and they placed *in situ* while it was soft and pliable and as hot as could well be borne. The patient was then directed to shut the jaw naturally, and it was then firmly pressed home and immovably fixed.

I applied the roller bandage at night for a week or so, to guard against any possibility of displacement from fright or other cause, though there seemed to be little occasion for it, for voluntary motion even was lost to the patient. The natural projection of the upper teeth over the lower, combined with the slight separation of the jaws caused by the caps, gave ample opportunity for the ingress of soups and slops by which the patient was nourished and supported, until the removal of the caps.

During the first two weeks considerable pain was experienced in the neighborhood of the fracture, and at the expiration of that time the provisional callus was perceptible through the tissues.

Four weeks having elapsed from the day in which the caps were applied, and six from the date of fracture, they were removed, and union found to be complete. For the first few days the articulating surfaces of the teeth did not readily coalesce, but at the end of a fortnight the recovery was perfect and satisfactory in every particular.

There was, upon removing the caps, some soreness of the mucous membrane, but this rapidly subsided under the use of an astringent gargle combined with chlorate of potash.

As a general rule fractures of the jaw are easily treated, the

roller, pasteboard and starch proving sufficient. But in this case they were of no service in restraining lateral motion, and until this experience, I confess I was not aware how difficult a thing it was to control that movement. I certainly gave them a fair trial, for Fergusson tells us in his work on surgery that he "does not take particular pains about the bandages after the fifteenth day," while in this two weeks elapsed without *any* perceptible change for the better; nor was there any promise that there would be if the same course was continued for a longer period.

In closing, I would say, that it is not of course to be expected that in all fractures of this nature, the incisors will be found conveniently separated and admitting of an application of just such a contrivance as this. But this report will have accomplished its errand, if from it any one shall have obtained a hint, assisting him to control the lateral movement of the jaw—a thing which, like many things else untried, seems to the uninitiated simplicity itself, while in fact it gives rise to an anxiety and vexation of spirit "not dreamt of in their philosophy."

ARTICLE IV.

CASE OF DISEASE OF THE BRAIN.

BY B. WOODWARD, M. D.

MESSRS. EDITORS,—The opportunities for making post-mortem examinations are so rare here in the West, that I am induced to trouble you with a slight history of a case and its revelations.

On the 31st of May last, I was called to see Willie, aged seven years, son of Rev. J. Blanchard, D. D. Has been in delicate health for several months, and for the last two months has exhibited a remarkable degree of drowsiness. He had been confined to his bed eight days, and been treated with domestic remedies by his parents. Found him with clean, moist tongue, rather pallid; pulse 100, and feeble; mind at times wandering; parotid gland on right side enlarged, and tender on pressure; right eye rather prominent with contracted pupil, the sclerotic

coat infiltrated with serum, and having a dull, clouded appearance; vessels of the eye not enlarged; breathing free and natural, except rather hurried; bowels in a healthy condition; urine healthy in quantity and appearance; head very hot, and from right nostril there was a continual discharge of bloody serum.

The symptoms, conjoined with appearance of the child, which was: fair skin, soft silky hair, contracted chest, large head and small limbs—pointed me at once to struma, with tubercular deposit on the brain. What else could I make of it?

R. Syr. iodide of iron and glycerin, and quinine et. pulv. Doveri.

The parents, not believing it possible that the case could be scrofula, discontinued the use of the medicine after giving two doses of each. Found him the next day with pulse 128, skin hot and mind more wandering, though the most of the time he lay in a semi-comatose condition. Ordered,

R. Tinct. verat. vir. gtt. ij. every two hours till pulse reduced.

In six hours the pulse was brought down to 98, but the parents being afraid of the medicine, it also was discontinued. The right eye continued to protrude, and before the death of the patient (which took place on the night of the 8th of June), it was so much protruded that the lids could not cover it. The coma became most profound, and he had no more lucid intervals, and total blindness of both eyes obtained for the last two days of life. Spasms of both hands and arms, but particularly of the right arm and hand, were very constant for the last forty-eight hours.

Permission was granted to make an examination of the head, and twelve hours after death, in the presence of Drs. Hard, Taylor and McCurdy, I made the post-mortem examination.

Appearance of the body natural, the protrusion of the eye not so great as during life.

On removal of the calvarium, the dura mater was found very much congested, and all its vessels much enlarged. It was covered with points of tubercles, from the size of the head of a pin to that of a large pea, which, on being pricked, gave out pus. Removing the dura mater, large quantities of serum flowed

out, and the arachnoid and pia mater were seen to be highly injected, and under the arachnoid were several spots of hæmorrhage, one of them near the top of the head as large as a twenty-five cent piece. Both arachnoid and pia mater were thickly covered with tubercles, the most of them softened. Removing now the brain, the whole base of the skull was found covered with pus, which was also oozing from innumerable points on the under surface of the brain. The bed of the optic thalami was occupied by a large abscess which had burst, and the pus had made a passage for itself along the right optic nerve into the cavity of the orbit. At the base of the cerebellum, at the superior portion of the medulla oblongata, we found a spot as large as a nutmeg completely disorganized, and cutting as low down on the cord as possible, it was found to be bathed in pus, and the membranes of the cord injected. The arachnoid had a dull, clouded appearance. Between the dura mater and the cribriform plate, was a collection of bloody serum, probably 3j., which seemed to have exuded from a diseased portion of the dura mater, and it had found its way through the cribriform plate into the right nostril, all the branches of the olfactory nerve being saturated with the fluid. The ventricles were all filled with serum.

Such extensive disorganization of the brain is seldom found, and it was a matter of surprise to the physicians who witnessed it (and they are all men perfectly conversant with morbid anatomy), that life should have continued so long.

We had a perfect solution of all the morbid phenomena. The protrusion of the eye was due to the pressure of the abscess on the optic thalami, and the infiltration of the pus through the optic foramen.

The spasms of the arms and hands were doubtless caused by the disorganization of the medulla oblongata; and the escape of bloody serum from the nostrils, by the collection over the ethmoid bone.

It was a matter of regret that we had not permission to examine other organs, as it would have been interesting to have traced the tubercular disease through the system. As it is, it was most satisfactory in establishing the diagnosis of the case;

and from the prominence of Doctor Blanchard, as President of Knox College, we hope we shall find it more easy in future to get permission to make post-mortem examinations.

It is a fearful fact, that strumous diseases are greatly on the increase. Risking the danger of being called "a hobby rider," I am compelled to pronounce many cases of disease "scrofulous" which have not been, and are not so called by many other practitioners, and the result of treatment seems to verify the diagnosis. With your permission, Messrs. Editors, I will before long send you the notes of a very interesting case of the kind.

GALESBURG, ILL., June 16th, 1858.

ARTICLE V.

EXAMINE YOUR MEDICINES.

TO THE EDITORS OF THE CHICAGO MEDICAL JOURNAL,—Permit a stranger to your pages (a stranger, not as a reader, but a writer), to call the attention of your readers very succinctly to the necessity of increased care in the choice and administration of our medicines.

Beside the ordinary adulterations with which we are all familiar, there appears to have been recent developments of new and dangerous additions to our common remedial agents which claim our serious notice. Thus, in the "Transactions of the College of Physicians of Philadelphia," we find Dr. Keating relating a case of an alarming character from the administration of three grs. of what purported to be Tilden's extract of hyoscyamus. The dose was followed by morbid respiration, complete insensibility, small and rapid pulse (150 in a minute), profuse, clammy sweat, pupils extremely dilated, scarlet effusion of the skin and inability to swallow. Dr. Ruschenberger corroborated the case by another in his own practice, in which a sailor, by the use of four grs. of similar extract, became delirious, had dilated pupils, troubled vision, red skin and dryness of the fauces. The reporter remarks that "the general impression" of the members present "seemed to be that the symptoms described were those

of belladonna only, and that, as the extract employed had not been tested by analysis, there must have been more or less extract of belladonna."

To these cases I may add one of my own. A little child took, in a compound of calomel, ipecac and prepared chalk for dysentery, one-fourth of a grain of soft extract of hyoscyamus; in an hour or two, its skin became red, its fauces dry, eyes affected, convulsive motions of its arms, eyelids and head, etc. This occurring but a day or two since, I have not examined the extract for belladonna; which, however, I fear, will be detected in the preparation.

At the same meeting of the college, Dr. Roger states that he was induced to examine ten specimens of sub-nitrate of bismuth from different apothecaries in Philadelphia, from the occurrence of a fatal case from the use of this powder, and that he detected arsenic in eight of the samples. This dangerous adulteration is not altogether new; but it has rarely been suspected, and as rarely looked for. All our authorities agree in representing earthy carbonates and carbonate of lead as the more common admixtures; but according to Prof. Bache (U. S. Disp.,) Lassaigne obtained one-sixth of one per cent. of arsenic from a parcel of sub-nitrate of bismuth bought in Paris.

Again, one of our apothecaries sold some sugar-coated compound calomel pills, which, the physician says, acted so drastically as to excite inquiry into the cause. Tilden was written to, and replied that the pills returned had been analyzed and found correct. Notwithstanding this, I subjected some of the same pills to a careful examination, and the result was, that I found the guaiacum, calomel, etc., all present, but not a particle of sulphuret of antimony; in the place of it, I obtained unequivocal evidence of the presence of tartarized antimony, by its reaction with metallic zinc, sulphuric acid, etc.

The subject is one which claims a more deliberate consideration than I am now able to bestow upon it, and therefore I submit the foregoing hastily penned paragraphs as simply suggestive.

JNO. T. PLUMMER.

ARTICLE VI.

(Translated by DR. BYFORD, from the *All. Med. Cent. Zeitung*.)

A CASE OF NATROPHAGIE.

RELATED BY DR. BÜCKER, CROWN PHYSICIAN, IN BONN.

Mr. Titz, formerly an apothecary, now a stock-jobber, sixty-two years of age, enjoyed excellent health during early life, and up to 1840. About this time, he became subject to daily emesis, which lasted to 1842, at which time he had become very much emaciated and bedridden. He now underwent treatment at Hamburg, with very great relief; but it was not long until the vomiting returned to its former distressing extent. The substance ejected was dark mucous coffee-grounds looking stuff, sometimes decidedly bloody, and very sour. The emaciation now became very great indeed.

Mr. Titz, from the fall of 1842 to the beginning of 1843, took daily a half ounce of bi-carbonate of soda, and from the year 1843 to 1854, daily, one whole ounce of the same substance, with complete relief to the vomiting. He sometimes took the salt with a little water, but ordinarily he chewed or swallowed the dry crystal. The taste became quite tolerable, in fact agreeable. He took the ounce in three portions, either shortly before or immediately after eating. It was for a quarter of an hour followed by eructations of carbonic acid gas.

In a few days after beginning, in 1842, to take the bi-carbonate, all the symptoms began to improve. The vomiting and acid eructations ceased, the appetite returned, the digestion became good, defecation regular and feces natural in appearance, the patient assumed the entire appearance of good health, and in a few months complete health was restored. Jocundity and rotundity took the place of his former meagreness and melancholy.

In 1854, Mr. Titz stopped the use of the soda; soon he felt weight in the epigastrium, and experienced flatulency, acid eructations, somnolence, weakness, yawning, asthma and rheumatic pains. He was for several weeks treated by different physicians, most of whom attributed his symptoms to the

inordinate use of soda. He grew worse, until, in despair, he resumed the bi-carbonate of soda, from six drachms to an ounce daily. From this time forward he improved, until, in a short time, every symptom had vanished, and up to this time Mr. Titz has enjoyed uninterrupted good health.

When he goes on a journey, and for a few days neglects his soda, the symptoms begin to make their appearance, to be entirely dissipated by a return to the remedy in full doses. It is necessary that at least six drachms or an ounce be taken daily to have the proper effect. His habits now are very regular. He rises at seven o'clock, takes his bread and coffee, dines at one o'clock, with a good appetite, taking afterward a glass of wine or beer, sleeps an hour, goes out walking, in the afternoon drinks a cup of coffee, mingles in society of evenings, takes a glass of wine or beer, sups, goes to bed at ten o'clock evening, and sleeps soundly till morning.

Mr. Titz is robust and healthy, of blooming countenance, strong in muscle and corpulent. His digestion, notwithstanding the extraordinary use of his soda, is good; his bowels are regular; the urine is alkaline, clear wine color and without sediment, ferments upon the addition of acid, and contains a great deal of bi-carbonate of soda.*

The lungs are perfectly sound. There seems to be some deficiency in the left auriculo-ventricular valves of the heart, which, however, causes no embarrassment. Pulse, sixty-five to the minute. The liver, spleen, kidneys, none of the abdominal organs, give any sign of disease whatever. In fact, Mr. Titz, for a person of his age, is a model of unexceptionable health. His four children, all grown, are also healthy. If, in consequence of an omission of his accustomed wine or beer, his appetite becomes poor, a somewhat large dose of the soda sets all things right with him in a few hours.

This brief history of a very singular case possesses several points of interest. We may from it, I think, draw a useful lesson, and have our views enlarged in regard to physiological processes.

* It would have been interesting to ascertain whether the feces did not contain the bi-carbonate of soda, but Mr. Titz would not give me an opportunity to experiment on them.

If it were true that alkaline mineral waters are a cure for obesity, that alkalis destroy the fat, Mr. Titz should be very much emaciated, instead of being so fat and lusty.

It is said the long use of alkalis deprives the bones of chalk. If this were true, Mr. Titz should have been cartilaginous before this time; but we find, that after fifteen years' use of soda, his osseous system is strong and firm. Also, if it is necessary for the gastric juice to be acid for complete digestion, what an enormous quantity of acid must the stomach of Mr. Titz secrete.

I should have been very glad to have entered into a series of research with Mr. Titz, in order to ascertain the effects of soda upon the organism, more particularly the secretions, but he would run no farther risk of effects which the withdrawal of the soda from him seemed invariably to produce; and to ascertain its precise influence, it was indispensable to withdraw it for some time. An analysis of the blood would also have been exceedingly interesting to me, but it was impossible to procure any for the purpose.

Although it was not in my power to develop this case in all its important aspects, I hope the foregoing account of it may not be altogether profitless.

BONN, June 2d, 1858.

BOOK AND PAMPHLET NOTICES.

TRANSACTIONS OF THE TWENTY-NINTH ANNUAL MEETING OF THE TENNESSEE STATE MEDICAL SOCIETY, held at Nashville, April 6, 1858.

It would seem, from the very few present at the meeting, that the great importance of such associations is not appreciated by the physicians of Tennessee; this is the case elsewhere, as we have reason to know, and is very much to be regretted. Nothing has contributed to elevate the standard of medical decorum so much within the last few years as the frequent association of physicians. They know each other better, under-

stand what is expected of each individual to the other, and are stimulated by the spirit of laudable ambition thus begotten, to make greater and nobler efforts in behalf of the *common cause*. Before the organization of the American Medical Association or our State and County Medical Societies, comparatively very little of a definite character was known by the mass of the profession about etiquette, ethics, good manners, professionally, etc., etc. Frequent conferences, however, of late have elicited the effect of different practices upon the standing and harmony of the profession, and established an enlightened and liberal code of ethics under which we may all live and associate in amity. If this was all that had been accomplished by these modern institutions, it would have been enough in all conscience to make us feel and take a deep interest in the sustenance of them and their influence; but this is not near half their benefits. Why, how many men in the ranks who could be seen only by close scrutiny along the line, after his name had been privately suggested by a friend, that now stand forth majors, and their names honorably and familiarly known from one side of our broad continent to the other, that must ever have remained destitute of even favorable mention but for the stimulus, fostering aid and publicity given them by professional societies? Writers of no mean character have been *developed* in this way. And then papers that have increased the reputation of the profession abroad would not have had their existence but for these societies. Trains of thought and research have been opened up and discoveries made that will live forever, that else would have lain dormant, perhaps, until the end of time. And the teachings of these associations are of incalculable benefit, particularly the smaller ones; the discussions and facts elicited always benefit some member; and we think it would not be extravagant to say, that every two hours' conference of twenty earnest and devoted medical men on medical subjects will always save twenty lives, by increasing the capacity of all for the efficient discharge of their duty toward the sick. Is there any objection to them? If there is one really valid reason why they should not be sustained, we cannot summon it before our minds this morning. Nothing but indolence prevents the large

majority of physicians from attending. All sensible, reflecting men will attribute habitual negligence of these institutions on the part of any member of the profession to downright, unpardonable laziness. It can be nothing else. And it will never fail to demonstrate itself, that such negligence, such laziness, will eventually ruin the delinquent. But to return to the Transactions of the Tennessee State Medical Society; the discussion, as recorded in the minutes, show both spirit and talent in the few members present.

There are only five papers contained in the Transactions, all very short, but practical and well written. The first is by J. L. Maddin, M. D., of Nashville, on the question, How does chloroform cause death? He states that there have been about one hundred cases of death from chloroform altogether; that these, without exception, occurred in operation in minor surgery; no fatal cases in obstetrics. The main practical point in the paper is, that the *local* anesthetic effect of the agent on the nerves of the lungs destroys the *besoian de respeirer*, and thus prevents the reflex stimulus upon the muscles of respiration. That instead of its control being exerted as a destructive agent more powerfully on the nervous centres directly, he thinks the respiratory act ceases from a complete annul of the organic sensitiveness of the lungs. This is, at least, very plausible, and may be true. As a remedy, he recommends artificial respiration until the chloroform gas is all evolved from the respiratory cavity and the anesthetic effect wears off.

The second paper is from Dr. Eve, giving an account of a patient who swallowed a set of artificial teeth. It has traveled the round of the medical journals so generally, that it is not necessary to notice it at any length. It is a curiosity.

The third paper is by L. M. Woodson, M. D., Sumner Co., Tenn., on a case of disease of Cerebro-Spinal Centres, characterized by constant hiccough, followed by death. It loses most of its interest from the fact that a post-mortem could not be procured.

The fourth paper is by W. P. Moore, M. D., of Linwood, Md., on Obstetric Medicine. The author relates several interesting but not extraordinary cases of obstetrics, and winds up with

some remarks upon the different operative modes of terminating difficult parturition.

The fifth paper is by C. K. Winston, M.D., of Nashville, and is made up of three cases of Traumatic Tetanus, successfully treated by large doses of sul. morphia and inunction of sweet oil. The morphia was given in quantities sufficient to control the spasms, which required it to be increased each successive day. Three recoveries of this dreadful disease from large and increasing doses of morphia ought to be remembered.

We hope next year to be able to greet a larger volume of as good material from the Tennessee State Medical Society, and see in their record an evidence of an increasing interest on the part of the profession at large in regard to an organization calculated to do so much good. W. H. B.

We have received the first number of the *Medical Journal of North Carolina*, August, 1858, edited by Edward Warren, M.D., and published under the auspices of the State Medical Society, at Edenton, N. C. It is a neat, well arranged and comely periodical, and under auspices of the whole profession of the State; and considering the fact that there is no other in the State, and that its editor is widely and favorably known to the medical world, we think and hope it will have an abundant success. We willingly comply with the request to "exchange."

W. H. B.

TILDEN & Co.'s BOOK OF FORMULA.—This is intended as a guide in the use of their preparations, and the compounding the official tinctures and solutions from their fluid and solid extracts. It will afford much information to persons desiring it in this connection. We have also received several numbers of his *Journal of Materia Medica*, which may be had by sending your name to them at New Lebanon, N. Y. With these were several specimens of sugar-coated pills and granules. We have already drawn the attention of our readers to these valuable preparations as supplying a desideratum in such times of fastidious taste as these are; a trial of them will pay. W. H. B.

EDITORIAL.

REPORTS OF THE SANITARY COMMITTEE TO THE COOK CO. MEDICAL
SOCIETY, AUGUST 3, 1858.

REPORT OF DR. E. L. HOLMES, FOR THE NORTH DIVISION OF THE CITY.

CHICAGO, August 3, 1858.

Your committee appointed to report upon the health of the North Division of our city, has comparatively little to offer. The season thus far has been one of remarkable health, and yet there is good reason to believe that the poor in many instances, suffering from poverty and want, have neglected to call medical aid even in cases of necessity. Undoubtedly, numerous deaths have occurred among children of the abject poor, without the knowledge of physicians. I infer this from the fact, that I have several times heard reports of such cases from people who knew the circumstances. I have also in my visits, in different sections of the North Division, seen children in a dying condition, to whom no medical assistance, as I was informed, had been called. The parents of these children, from the difficulty of gaining a support, seemed indifferent to their recovery, and even wished them to die. How far this degree of inhumanity is prevalent among the poor of our city, I am unable to judge.

During the past month, although the weather upon the whole has been delightful, abdominal diseases, especially among children, have been more prevalent and deaths more numerous. Atmospheric influences undoubtedly have much influence in producing these results, but I apprehend that neglect and inefficiency on the part of parents are the great causes of mortality among the poor children of our city. And yet if we examine into the condition of the dwellings of the poor wretches, for instance, who live near the river on the North Division, between Kinzie and Superior streets, I think we shall find other causes of disease and death. The ground is lower than in some other portions of the city, the drainage is incomplete, the contents of privies and every kind of offal remain for a long time upon the surface of the earth. It seems almost incredible that

human beings can live under such circumstances. Fortunately this portion of the city will soon be improved.

I have seen and heard of numerous cases of measles and scarlatina.

My attention has been called to several very severe cases of cholera morbus. Two of these cases, I must confess, I am not disposed to regard as cholera morbus, but true cholera, perhaps of a mild form, and I think no one of experience, who had seen them in a season of epidemic, would hesitate to call them so. The first case was that of a German laborer, 45 years of age, very tall and of great apparent physical strength, who, without any known cause, was attacked in the afternoon of July 22 with severe vomiting and purging without the slightest pain. From the fact that there was no pain, patient thought he would soon be better and consequently sent for no physician. The symptoms in a couple of hours became less violent, but at four o'clock the next morning returned, with exception of the vomiting, with renewed energy. As there was still no pain, patient flattered himself that the attack would pass off without medical aid; but at four o'clock in the afternoon, after having passed more than thirty copious watery evacuations, he sent for me. I found him upon his back, nervous force almost wholly prostrate, extremities cold, lips livid, pulse feeble, cold perspiration upon the face and hands. The discharges were still very frequent, and resembled very diluted arrow-root as prepared for the sick, with something like Indian meal at the bottom of the vessel. The patient complained of nothing but thirst and weakness.

The second case was that of an Irish woman, aged 25, married, and of remarkably good constitution. Without known cause, at three o'clock, July 31, she was so violently attacked with vomiting and purging, that after throwing herself upon the bed, she had not strength enough to call the assistance of her neighbors. In a couple of hours a friend happened to call and found her in her prostrate condition. A few minutes after this on reaching the house, I found her still somewhat inclined to vomit; so weak that she could scarcely rise upon her elbow; the discharges from her bowels copious, watery and passing away involuntarily. The feather bed upon which she lay was

wet through. Upon examining the sheets, I found there was no discoloration from the discharges and hardly any smell. A small quantity of the discharges collected in a vessel resembled a mixture of white Indian meal with a large proportion of water. The patient had no pain, lips blanched, extremities, however, not cold, pulse feeble, constant sighing with difficulty of breathing, complaining of intense burning thirst. Patient was evidently much frightened. This, however, could not account for the great prostration of strength, since the number and quantity of the discharges during the time I was with her, were sufficient to account for her loss of strength.

Both of these patients recovered under treatment which consisted of small doses of calomel and opium often repeated (every fifteen minutes for a couple of hours, and then every half hour for the same time), with small doses of brandy and capsicum, and injections of laudanum and starch into the rectum after every discharge; I also applied cloths wet with hot mustard water to the external surface.

In the course of a couple of hours, marked relief of symptoms appeared. In a couple of days, patients were able to leave the bed. In the last case I must admit, that the calomel less than fifteen grains produced a very slight soreness of gums.

E. L. HOLMES.

REPORT OF DR. D. D. WAITE, FOR THE WEST DIVISION OF THE CITY.

CHICAGO, August 3, 1858.

The undersigned Sanitary Committee for West Chicago respectfully report:

That the health of the West Division of the city, for the past month, has been unusually good for the season.

The very cool turn of weather which set in the second week of the month, succeeding the three weeks of weather so warm that the mercury stood at an average of 90 degrees, was, according to reasonable expectation, immediately followed by a general prevalence of diarrhea, cholera morbus and some dysentery. These have constituted the burthen of disease for the last three weeks. Yet in a very few cases have they

proved dangerous or extremely troublesome. In my own cases, with the aid of a little calomel, I have successfully combated the endemic of the season, with a combination of morphine, tannin and quinine.

I have seen but one death from cholera infantum. This was a child of one year, who had endured the wasting disease for four or five days without intermission. The flesh and natural visage nearly gone, and in deadly collapse, at the time I was called.

Here I will state, to illustrate a fact to which I wish to call attention, that this child, in this extreme condition, was brought more than a mile in the arms of its mother, uttering an incessant moan, which plainly enough told its fate as soon as my door was opened.

Last year, I saw a number of cases of this kind among the destitute, who either died without medical aid at all, or only received it when too late to be of service. From what observations I have made, and from what I have learned last season and this, I am now satisfied that nearly one-half of all the deaths of children in the city occur from the want of timely medical aid, and the suitable nursing and surroundings of a sick person. Indeed, I know that many children of the poorest class, who live entirely outside of society and outside of common care, die without any medical aid, and sometimes, as I have also had occasion to know, while the parents were too drunk to realize their danger. These sad facts may account for the circumstance that physicians are often surprised at hearing the report of city deaths, especially of children, having seen nothing in their practice to apprise them of so large a number.

This will also in part account for the greater mortality of city than of country.

Here and there, a solitary case of intermittent or remittent fever, or, in common parlance, of ague and fever, with their tawny, muddy, or dusky-yellow visage, are occurring, like the last of the Mohicans, to remind us of a race of diseases now nearly extinct, which formerly created great havoc and terror in the early settlements of Northern Illinois and vicinity. For the management of these, little else than blue pill and quinine

is needed. I will remark, that in my own practice, several severe cases of cholera morbus in adults have occurred, which, in cholera times, would certainly have been set down as such. In the case of one lady of fifty, most intolerable crampings continued, in spite of all my efforts, for some ten or twelve hours after the discharges had ceased and the circulation was in a good measure restored.

I think that ether did more than any other remedy in quieting them.

In this case, the use of opium in any form being wholly interdicted by a constitutional idiosyncrasy, I think I checked the alvine fluid (it was but water with a slight greyish tinge) with injections of sulphate of zinc. I have heard of a few fatal cases of the kind.

DANIEL D. WAITE.

In addition to the foregoing reports, we copy the following, which shows the entire mortality of the city for the month of July:

South Division	117
West "	81
North "	70
Total.....	268

The mortality for the same month for a series of years past is as follows:

'48.	'49.	'50.	'51.	'52.	'53.	'54.	'55.	'56.	'57.	'58.
41	411	240	67	179	111	984	236	266	254	268

The diseases of the month were as follows:

Inflammation of Lungs.....	9	Convulsions	4
Inflammation of Brain.....	11	Still-born	7
Inflammation of Stomach.....	2	Erysipelas.....	1
Bilious Fever	1	Canker-Sore Mouth.....	2
Typhoid Fever	1	Consumption.....	37
Scarlet Fever.....	23	Debility.....	3
Delirium Tremens.....	1	Peritonitis.....	1
Ulcer of Stomach.....	1	Dropsy.....	3
Gastro-Enteritis.....	1	Rheumatism	1
Dysentery.....	108	Apoplexy.....	1
Teething.....	18	Old Age.....	1
Measles	5	Sun-stroke	1
Croup.....	1	Violent Death	1
Whooping Cough.....	1	Accident.....	4
Cholera Morbus.....	2	Drowned.....	6
Cholera Infantum	12	Unknown.....	2

It will be seen that dysentery has been the chief prevailing disease for the month; furnishing almost half of the whole number of deaths. It has prevailed chiefly among children under three years of age. In most instances it has been mild and easily controlled by proper treatment.

From personal observation, we think that three-fourths of the deaths from this disease have occurred among the children of the poorer classes, who are prone to attribute all affections of the bowels during the first two years of life to "teething;" and therefore neglect all medical aid until the children are irrecoverably exhausted. From various sources we have learned, that dysentery and fevers are quite prevalent in many sections of the State. But we have had no detailed account of the special characters they assume.

In this city, attacks of fever, either continued or periodical, were of rare occurrence until the third week in August. From that time to the present (Sept. 5th), we have met with febrile attacks quite frequently, and presenting some features worthy of notice. In the typhoid cases there was, during all the first week, decidedly more gastric irritation, manifested by vomiting, especially after taking either food, drink or medicine; and less intestinal disturbance than in ordinary cases. The bowels were moderately costive, and in very few instances have they become tympanitic, even in the advanced stages of the disease. Many of the patients have complained of an unusual degree of distress or heaviness through the chest and epigastrium, with constant sweating and great sense of weakness. In a few instances the sweating has commenced with the forming stage, and has continued profuse throughout the whole course of the disease, causing the skin to feel cold and clammy to the touch, and corrugated as if long macerated in water. In these cases, the pulse becomes soft and weak, the tongue moist, thirst urgent, urine scanty, and the sense of weakness extreme.

Unless a favorable change takes place during the latter part of the second week, in addition to the symptoms enumerated, the mind becomes dull and indifferent, the eyes sunken, the pulse small and quick, the lips purple or leaden color, and the breathing either very feeble or slow and sighing. In the Mercy

Hospital and among the poor in the city, I have seen three fatal cases. In one of these, hemorrhage from the bowels occurred twelve or fourteen hours before death; but in the other two, death seemed to occur from simple exhaustion of the vital properties of the tissues.

In some of the cases but little pain was felt during the whole course of the disease. But in others, the pain in the head was persistent and severe for four or five days, and followed by an unusual degree of somnolence.

In some of the cases, a copious miliary eruption appeared on the surface between the fifth and tenth day of the disease, and continued until convalescence was established. From these observations it will be seen, that the frequent periods of profuse sweating, the soft and compressible pulse, the absence of abdominal tympanitis, together with the early feelings of exhaustion, constitute the prominent or peculiar features of the present prevailing form of continued fever. And they are sufficient to indicate great organic debility, or, in other words, decided diminution of both susceptibility and vital affinity throughout the organized structures of the body. This direct depression of the vital properties or forces causes all the primary functions, such as secretion, cell growth, muscular contraction, nerve sensibility, etc., to be feebly executed. Hence, both respiration and circulation become feeble, the skin becomes relaxed as in the advanced stage of cholera, the saline matter of the blood rapidly passes off in the copious perspiration, and the patient is in imminent danger of death, not from local congestions, inflammations, or disorganization of structures, but from simple exhaustion of vital force and consequent cessation of organic action. We might cite several cases illustrating the prevailing type of fever. But we have space for only a brief notice of three; two of which were treated in the Mercy Hospital, and the other in private practice.

CASE 1. Mr. ———, a German laborer, aged about thirty-eight years, was admitted into the Mercy Hospital on the 25th of August. He had been sick about ten days. His skin was cool and wet with perspiration; his eyes dull and upper lids drooping; lips pale and tongue moist; mind incapable of being

fixed long enough to answer questions correctly; pulse soft, small and 120 per minute; abdomen soft and not tympanitic, and intestinal and urinary evacuations involuntary. Although these symptoms plainly indicated a *moribund* condition of the patient, yet neither they, nor anything we could learn concerning the history of the case, indicated the existence of any special local lesions sufficient to produce a fatal result. He died on the evening of the 26th, about thirty hours after admission, apparently from entire failure of the elementary properties and functions of the system.

CASE 2. Mr. B., a German, aged about forty years, was admitted into the Hospital on the 25th of August, 1858. He had been sick about ten days with continued fever, apparently mild in its character. At the time of admission, his face was moderately flushed; eyes dull; lips dry; tongue covered with a brownish coat, but not entirely dry; skin generally dry and above the natural temperature; respiration natural; pulse 100 per minute, and moderately firm; abdomen entirely free from tympanitic distension, but the bowels quite inactive, there having been no alvine evacuation during the preceding three days. He complained of much headache, sleeplessness, and occasionally a disposition to vomit. He was directed to take a powder containing calomel two grs. and bi-carb. soda five grs. every four hours until it should move the bowels.

Aug. 26th. Symptoms unchanged, and no alvine discharges. Ordered castor oil \mathfrak{zss} ., and should it operate freely, have it followed by an emulsion of oil of turpentine and tincture of opium, with two grains of quinine in each dose.

Aug. 27th. The castor oil operated freely yesterday, and was followed by the emulsion and quinine. The pain in the head was much relieved, otherwise the condition of the patient did not seem materially altered. Continued the same treatment with beef-tea for nourishment.

Aug. 30th. Found the patient this morning much more feeble. His skin was cool and very moist with perspiration, presenting on the fingers and hands a corrugated or shriveled appearance; the eyes more dull and sunken; the lips of a purplish color; tongue moist; abdomen flaccid and bowels inactive; pulse 120

per minute, small and soft; respiration unobstructed and quiet, but feeble; and mind dull or unconcerned. It was evident from the state of the skin, together with the feebleness of both respiration and circulation, that the vital forces of the patient were rapidly undergoing exhaustion. And yet, there had been no excessive evacuations or other apparent cause for such depression. To increase innervation and maintain a better degree of organic affinity, the patient was directed to take the sixteenth of a grain of strychnine in solution with four drops of nitric acid and water, every four hours, and two grains of sulphate of quinine between.

Aug. 31st. All the symptoms remain the same as yesterday, except that the circulation and respiration are both still more feeble, and the expression of the patient more sunken. Continued the strychnine and nitric acid every three hours, but omitted the quinine and gave in its place ten gr. doses of chlorate of potassa in solution; also, beef-tea, well salted, for nourishment. The object of making this change, as stated to the students visiting the Hospital at the time, was to increase the saline matter in the blood, and thereby increase its capacity for absorbing oxygen from the pulmonary organs. The purple or leaden hue of the skin, etc., plainly indicated a deficient decarbonization and oxygenation of the blood. It was evident that neither quinine nor ordinary diffusable stimulants, were calculated to remedy this elementary pathological condition. But if a greater quantity of oxygen could be introduced into the blood, it would do more to re-excite and sustain the failing organic sensibility and capillary action, than all other agencies with which we are acquainted. Hence, we ordered the chlorate of potassa as medicine and the chloride of sodium as condiment for the animal broth. The result in this case fully justified our theory; for on the following day we found every symptom of the patient improved. And by continuing the treatment four days, convalescence was fully established. During the last few weeks we have had occasion to prescribe the chlorate of potassa in several cases of continued fever presenting similar symptoms with the patient just alluded to and with uniform advantage. The following affords a striking example:

CASE 3. Mr. M., a young man, native of Ireland, had been sick with continued fever about seven days, and under the care of an intelligent physician. On Tuesday, a messenger called on us saying, that the young man had been given up by his physician, and he was very anxious that we should see him. Knowing that there was very little reliance to be placed on the representations of that class of people, we did not answer the call that day. The next it was repeated with still more urgency, and we visited the patient. Found him occupying a dorsal position in bed; the head thrown back; the eyes turned upward, with drooping of the upper eyelids; a leaden hue of the lips; skin generally cool, covered with perspiration, and of a color indicating deficiency of capillary circulation; bowels inactive and abdomen flaccid; tongue and mouth moist; pulse small, soft and 115 per minute; respiration easy but feeble, and mind very dull. The attendants had not been able to make him "know anything" during the last twenty-four hours, and it was with difficulty that we induced him to partially protrude his tongue. The urine passed involuntarily, and the last fæcal evacuation was not controlled by the patient. Finding no evidence of local structural lesions, and believing the condition of this patient essentially dependent on the same loss of organic sensibility or susceptibility, with consequent diminution of capillary action and æration of the blood, as described in reference to Case 2, we ordered for him the following:

R̄ Chlorate of potassa, ʒij.
Mucilage of gum Arabic, ʒiv.

Mix, and give a table-spoonful every two hours; also, ten drops of chloroform, in sweetened water, between each of these doses. For nourishment, we directed beef-tea, well salted, or milk. The treatment was faithfully carried out, and in less than twenty-four hours he became sufficiently conscious to answer questions correctly, the clammy sweat disappeared, and his pulse became slower and more full. The same treatment was continued, only the medicine given at longer intervals. In two days more he had recovered full possession of his mental faculties, and control of his evacuations, with a pulse 90 per minute and soft, and some relish for nourishment. The chloro-

form was now omitted, and the chlorate of potassa continued every three hours. No other medicines have been administered, and the patient is now, fifteen days from the commencement of the attack, convalescent.

In the commencement of this article we used the word typhoid; but it is evident that the continued fevers we have met with during the last three weeks have partaken much more of the nature of *typhus* than of typhoid fever, as technically defined by medical writers. Since the middle of August, attacks of periodical fever have been more frequent than usual. Most of the cases that have come under my observation have been simple, and easily interrupted in their course by ordinary anti-periodic doses of quinine. But a few cases have exhibited a decidedly pernicious and dangerous character. The following case will illustrate these attacks better than any general description:

CASE 4. Mr. R., a native of Ireland, aged twenty years, was admitted into the Mercy Hospital, Sept. 1st, 1858. He had been sick five days. Said he had had chills and fever every day, the cold stage occurring in the evening. At present, his countenance is dull, lips slightly bluish or leaden color, tongue moist but coated, bowels inactive, stomach irritable, with disposition to reject drinks, and complains of a sense of oppression or distress in the epigastrium. His skin is nearly natural in temperature and moisture. Fearing that quinine, if given immediately, would be rejected on account of the irritability of the stomach, we directed for him three or four small doses of calomel and morphine, to be followed by castor oil sufficient to open the bowels. Before the time came, however, to take the oil, his next paroxysm came on. The cold stage was characterized by great depression; a small, frequent and feeble pulse; a purplish or leaden hue of the skin; great restlessness and anxiety, but with very little muscular agitation or trembling. The febrile reaction was slow and imperfect, and the sweating stage slight.

As soon as the character of this paroxysm had been observed, the patient commenced taking sulph. of quinine four grs., with pulv. opii one and a half grs., every three hours. The medicine was taken faithfully throughout the day and was not rejected by

vomiting. Still, at the usual hour in the evening, another paroxysm came on, with symptoms of the most dangerous character. We made an extra visit to the Hospital near nine o'clock in the evening, and found him with lips and face of a dingy hue; the skin everywhere cold and covered with a clammy moisture; the pulse 142 per minute, small and feeble; the respiration irregular, intermittent and sighing; great restlessness and sense of oppression in the chest and epigastric region, with occasional efforts to vomit. He had been in this state nearly three hours. We immediately discontinued the quinine and opium, ordered a strong sinapism of mustard to the dorsal spine, and internally ten grs. of chlorate of potassa every hour, and ten gtts. of chloroform between, until indications of reaction were seen, when the intervals between the doses should be lengthened. The next morning found the patient quiet, skin warm and dry, pulse 95 per minute, general feeling comfortable though weak. Directed the chlorate of potassa and chloroform to be continued alternately two hours apart; and as the bowels had not been moved during the last three or four days, three powders, each containing quinine three grs. and calomel five grs., were given at intervals of four hours, to be followed by castor oil if they did not operate. The bowels were freely moved after the oil on the morning of the 4th, and the patient continued much improved. The chloroform was omitted, and the chlorate of potassa alone continued, with animal broth for nourishment. The patient had no further paroxysms, and is now quite well.

In three other strongly-marked cases of pernicious intermittents, we have prescribed the same remedies with the same happy results. Sometimes, we combine the chloride of sodium with the chlorate of potassa. It has seemed to me that the fevers of the present season, whether periodical or continued, present a strong typhus tendency. And the principal object of the foregoing observations is to call the attention of our readers to this feature, and awaken thought as to the best mode of counteracting it. Will some of our readers in those country districts where fevers are prevalent, favor us with an account of their special characteristics?

APOLOGY AND BILLS.—The undersigned has delayed the issue of the present number, to carry out a determination to personally examine every man's account, and enclose the same in the Journal. It has cost much more time than we expected. The bills are made as they stand on our books. If any subscriber receives one he thinks erroneous, let him immediately inform us and we will be happy to make any corrections required. Let none infer from the delay of this number that we contemplate suspending the Journal. We shall *suspend* it to those only who fail to pay for it, as stated in the July number. All who pay will receive the Journal more promptly in future than any time heretofore.

N. S. DAVIS, *Proprietor.*

RUSH MEDICAL COLLEGE.—Clinical instruction and dissections will commence in connection with this institution on the first Tuesday in October. The Hospital is well filled with patients, and quite a class already in attendance three times a-week. The material for dissection will be abundant. A course of preliminary lectures will also be given during the month of October. The prospects for a good class, and the preparations for their instruction were never better.

STARLING MEDICAL COLLEGE,

COLUMBUS, OHIO.

SESSION OF 1858-59.

THE REGULAR SESSION OF STARLING MEDICAL COLLEGE WILL begin on Wednesday, the 20th day of October, 1858, and continue till the first of March.

FACULTY.

S. M. SMITH, M.D., *Professor of Theory and Practice.*

FRANCIS CARTER, M.D., *Professor of Obstetrics, and Diseases of Women and Children.*

J. W. HAMILTON, M.D., *Professor of Surgery.*

JOHN DAWSON, M.D., *Professor of General and Special Anatomy and Physiology, and Dean.*

S. LOVING, M.D., *Prof. of Materia Medica, Therapeutics and Medical Jurisprudence.*

THEO. G. WORMLEY, M.D., *Professor of Chemistry.*

R. N. BARR, M.D., *Demonstrator of Anatomy.*

F E E S .

Tickets of all the Professors,	\$60 00
Matriculation Ticket, paid but once,	5 00
Graduation Fee,	20 00
Ticket for the privilege of the Dissecting Room, including the services of the Demonstrator,	8 00

Subjects for dissection in the building, furnished at a moderate expense, on application to the Demonstrator of Anatomy, and in no other way.

Inquiries and requests being sometimes made for indulgence in time, we propose to allow, in such cases, that a judgment note for \$65, with interest and approved security payable in one year, may be taken. But our rule is payment within the first three weeks of the session.

There are two extensive Bookstores in Columbus, at which Medical works in great variety are sold at very low rates. Surgical, Obstetrical and Dissecting instruments are readily obtained.

All letters of inquiry will receive prompt attention, if addressed to any member of the Faculty, or to

JOHN DAWSON, *Dean.*

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MEDICAL COLLEGE OF OHIO

CINCINNATI.

SESSIONS OF 1858-1859.

THE THIRTY-NINTH ANNUAL COURSE OF LECTURES, IN THIS Institution, will commence on the 15th of October, and continue until the last of February.

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 JESSE P. JUDKINS, M.D., *Prof. of Anatomy.*
 GEORGE C. BLACKMAN, M.D., *Prof. of Surgery and Clinical Surgery.*
 GEORGE MENDENHALL, M.D., *Prof. of Obst. and Dis. of Women and Child.*
 JAMES GRAHAM, M.D., *Prof. of Materia Medica and Therapeutics.*
 C. G. COMEGYS, M.D., *Prof. of the Institutes of Medicine.*
 H. E. FOOTE, M.D., *Prof. of Chemistry.*
 THOMAS WOOD, M.D., *Prof. of Microscopic and Surgical Anatomy.*
 JOHN A. MURPHY, M.D., *Adjunct Prof. of Pract. of Med. and Clinical Med.*
 B. F. RICHARDSON, M.D., *Adjunct Prof. of Obstetrics, etc.*
 WM. CLENDENIN, M.D., *Demonstrator of Anatomy.*

CLINICAL INSTRUCTION.

The Faculty are determined to devote much time and attention to Clinical instruction. The patients of the Commercial Hospital and City Dispensary (which are under the exclusive control of the Medical College of Ohio), will be examined, prescribed for, or operated upon daily in presence of the class. Opportunity for witnessing cases and operations at St. John's Hotel for Invalids will also be presented.

The Anatomical Rooms will be opened on the 1st of October. Material for dissection will be abundant.

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Professor's Tickets,	- - - - -	\$80 00
Dissecting Ticket,	- - - - -	6 00
Hospital Ticket,	- - - - -	10 00
Graduation Fee,	- - - - -	25 00

At the close of the Session, the Faculty will elect from the class seven House Physicians, to reside in the Hospitals and Dispensary for one year.

For further information, call at the College on Sixth street, between Vine and Race; or address the Dean.

L. M. LAWSON, M.D., Dean,

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We are prepared to offer the manufacturers' best terms to the trade, and being at all times well supplied, respectfully solicit orders.

We subjoin a List of these Preparations, to which additions will be made from time to time.

<i>Powders.</i>	<i>Obtained from</i>	<i>per oz.</i>	<i>Powders.</i>	<i>Obtained from</i>	<i>per oz.</i>
Ampelopsin,	Ampelopsis Quinque,	\$1 50	Rumin,	Rumex Crispus,	\$0 75
Alnuin,	Alnus Serrulata,	1 00	Sanguinarin,	Sanguinaria Canadensis	0 75
Apocynin,	Apocynum Cannabinum,	2 00	Scutellarin,	Scutellaria Lateriflora,	1 50
Asclepin,	Asclepias Tuberosa,	1 50	Senecin,	Senecio Gracilis,	1 50
Baptisin,	Baptisia Tinctoria,	1 00	Stillingin,	Stillingia Sylvatica,	1 25
Caulophyllin,	Caulophyllum Thalic.,	0 75	Strychnin,	Strychnos Nux Vomica,	8 00
Cerasin,	Cerasus Virginiana,	1 50	Trilliin,	Trillium Pendulum,	1 00
Chelonin,	Chelone Glabra,	1 25	Veratrin,	Veratrum Viride,	1 50
Cornin,	Cornus Florida,	1 00	Viburin,	Viburnum Oxyococcus,	1 50
Corydalin,	Corydalis Formosa,	4 00	<i>Concentrated Tinctures.</i>		
Cypripedin,	Cypripedium Pubescens,	1 00	Con. Tinc. Apocynum Andro.		\$1 00
Digitalin,	Digitalis Purpurea,	1 50	" " Chelone Glab.		0 50
Euonymin,	Euonymus Americanus,	1 50	" " Digitalis Purp.		0 50
Euphorbin,	Euphorbia Corolata,	1 50	" " Euonymus Amer.		0 50
Eupatorin,	Eupatorium Perfolia,	1 00	" " Eupatorium Purpu.		0 75
Eupatorin,	Eupatorium Purpureum,	1 50	" " Gossypium Herb.		1 00
(Purpu.)			" " Rhus Glab.		0 50
Gelseminin,	Gelsemium Semper.,	2 00	" " Scutelloria Later.		0 50
Geranin,	Geranium Maculatum,	0 62	" " Senecio Gracilis.		0 50
Helonin,	Helonias Dioica,	1 75	" " Strychnos Nux Vomica.		1 00
Hydrastin,	Hydrastis Canadensis,	1 25	" " Xanthoxylum Frax.		0 62
Hyoeciamin,	Hyoecianus Niger,	2 50	Con. Comp. Stillingia Alternative,		1 00
Irisin,	Iris Versicolor,	1 00	Xanthoxilin Pills,		0 50
Jalapin,	Ipomoea Jalapa,	1 00	<i>per bot.</i>		
Juglandin,	Juglans Cinerea,	0 75	Con. Tinc. Gelseminum Semp. 6 oz. bot.		1 00
Leptandrin,	Leptandria Virginica,	0 75	" " Veratrum Viride, 4 oz. bot.		0 75
Lupulin,	Humulus Lupulus,	1 00	Wine Tinc. Lobelia Infl., 6 oz. bot.		0 50
Macrotin,	Macrotys Racemosa,	0 62	<i>Oils.</i>		
Menispermmin,	Menispermum Canad.,	1 00	Oil Lobelia,		1 50
Myricin,	Myrica Cerifera,	0 62	" of Capsicum,		0 75
Phytolacin,	Phytolacca Decandra,	1 00	" " Erigeron,		0 50
Podophyllin,	Podophyllum Peltatum,	0 75	" " Populus,		0 50
Populin,	Populus Tremuloides,	0 50	" " Stillingia,		1 00
Prunin,	Prunus Virginiana,	0 75	" " Zanthoxylum,		0 75
Rhusin,	Rhus Glabrum,	1 00	Oleo-Resin of Lobelia,		0 75

Pocket Medicine Cases, filled with Concentrated Medicines.

No. 1.	20 vials,	\$5 00
" 2.	24 "	6 00
" 3.	28 "	7 00

An extra charge of ten cents per oz. will be made for medicines put up in half oz. vials.

All the articles manufactured at their Laboratory will bear the stamped label, "Prepared at the Laboratory of B. Keith & Co. NEW YORK." They will also be hermetically sealed and stamped "B. Keith & Co. Organic Chemists, N. Y."